武經總要

六

詳校官中書臣閔思毅

編修臣倉聖脈覆勘

武經總要前集卷十二

宋 曾公亮等 撰

守城 并器具圖附

兵法曰守城之道無恃其不來恃吾有以待之無恃其不攻恃吾有所不可攻故善守者敵不知所攻非獨為城高池深卒彊糧足而已必在乎智慮周密計謀百變或彼不來攻而我守或彼不挑戰而我擊或多

方以謀彼師或屢出以疲彼師或彼求鬬而我不出或彼欲去而懼我若此者皆古人所以坐而役使敵國之道也此雖得禦攻之計然又要先審可守之利害凡守城之道有五敗一曰壯大寡小弱衆二曰城大而人少三曰糧寡而人衆四曰蓄貸積於外五曰豪彊不用命加之外水高而城内低土脈疎而池隍淺守具未足薪水不供雖有高城宜棄勿守亦有五全一曰城隍修二曰器械具三曰人少而粟多四曰

上下相親五曰刑嚴賞重加之得大山之下廣川之
上高不近旱而水用足下不近水而溝防省因天財
就地理土堅水流險阻可恃兼此形勢守則有餘故
兵法曰城有不可攻又曰善守者藏於九地之下皆
謂此也凡守之道敵來逼城靜默而待無輒出拒候
其矢石可及則以術破之若遇主將自臨度其便利
以彊弩叢射飛石併擊之則軍聲阻喪其勢必遁
若得敵人稱降及和切勿弛備當益加守禦防其詐

我若敵攻已久不拔而去此為疲師可躡而襲之必破此又寄之明哲見利而行不可羈以常檢也古法曰三里之城萬家守之足矣今若遇敵逼近人力不暇者即且約容一軍人馬如築於閒時須稍寬闊作四門二開二閉門外築甕城城外鑿壕去大城約三十步上施鈎橋壕之內岸築羊馬城去大城約十步凡城上皆有女牆每十步及馬面皆上設敵棚敵圍敵樓窺城敵圍城角也有戰棚棚樓之上有白露屋城門重門揷版鑿扇城之外四面有弩臺自

敵棚至城門常設兵守以觀候敵人圖形於左

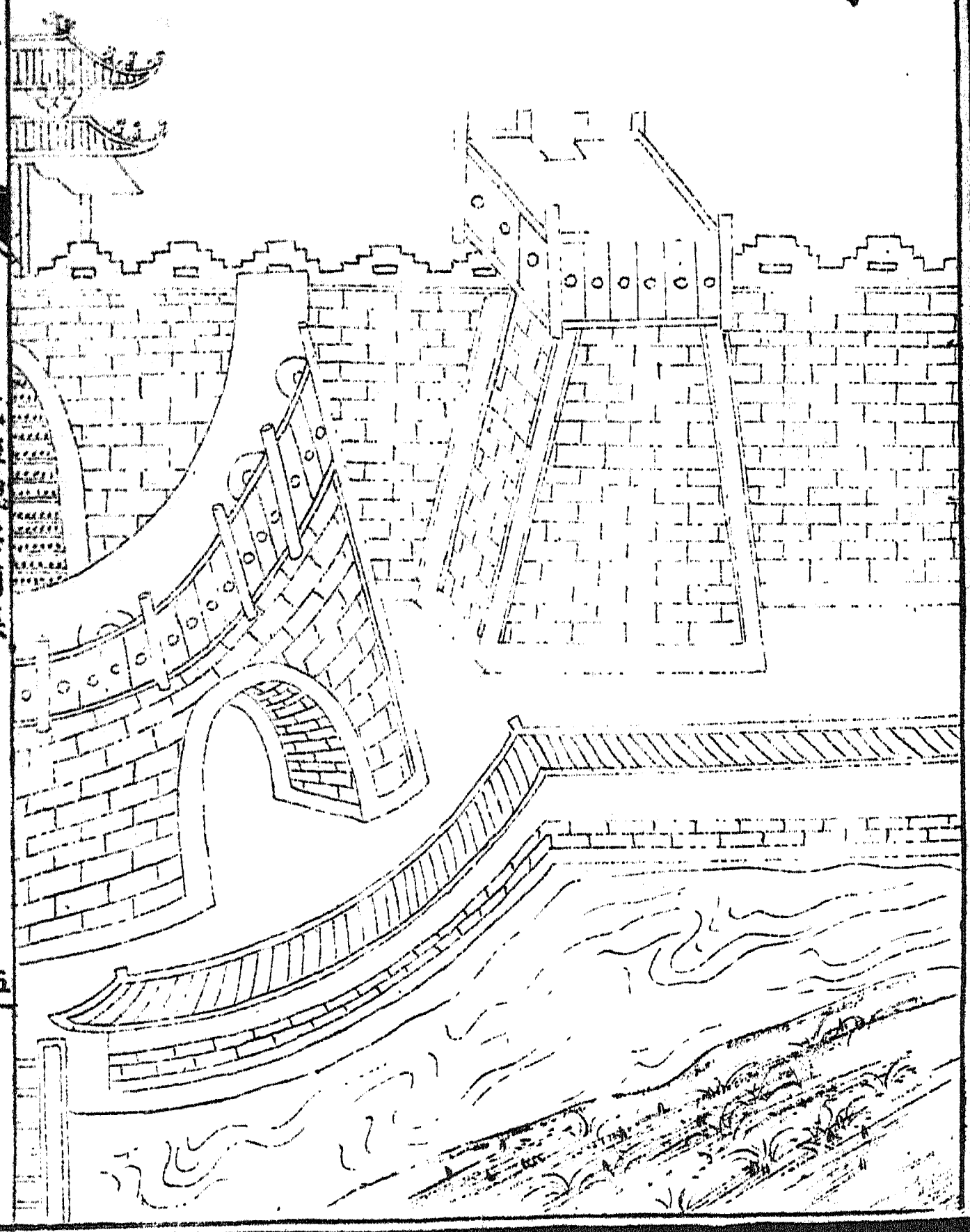
右平陸築城下闊與上倍其高又與下倍假如城高五丈則下闊二丈五尺上闊一丈二尺五寸其城外甕城或圓或方視地形為之高厚與城等惟偏開一門左右各隨其便

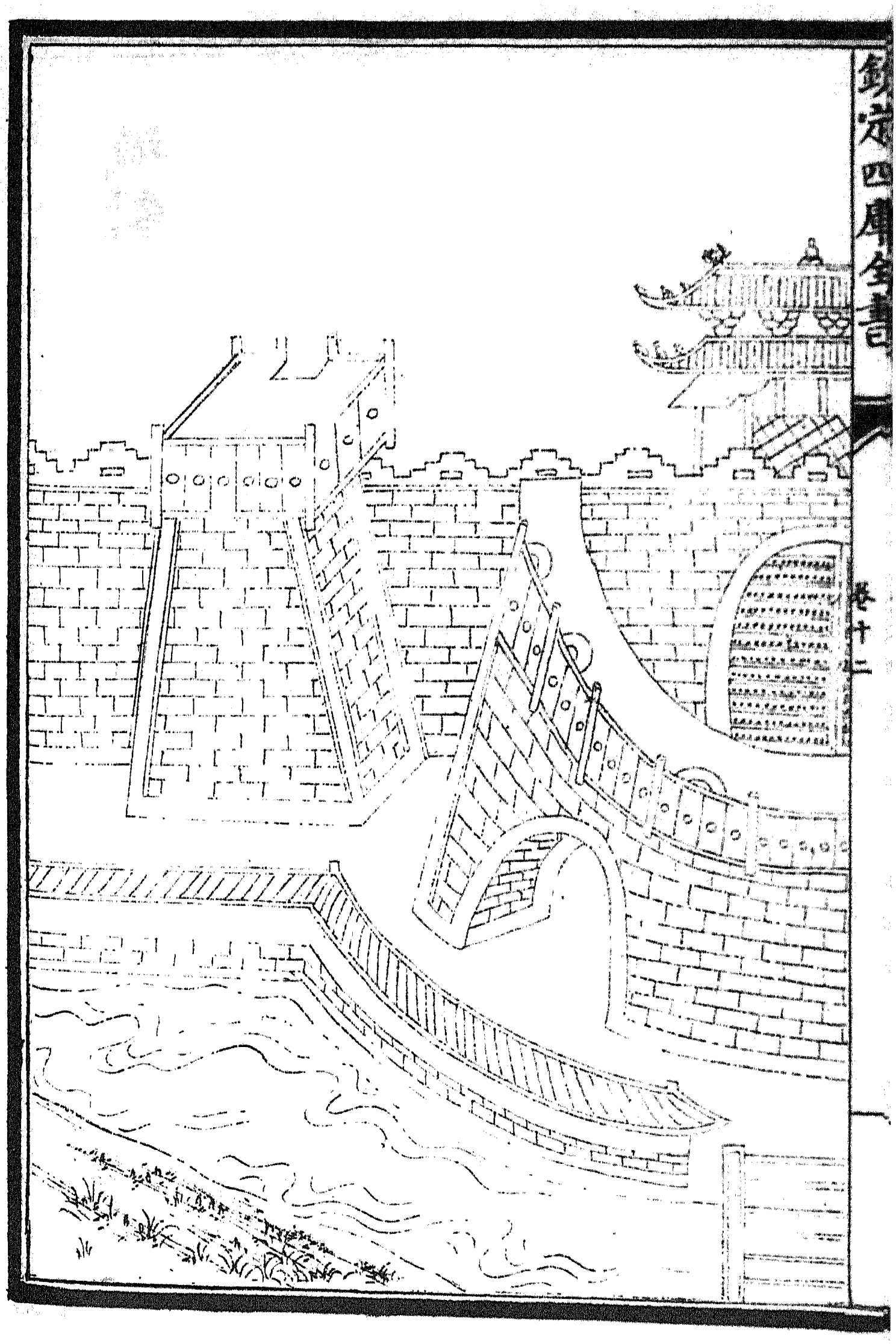
羊馬城高可一丈以下八尺以上亦偏開一門與甕城門相背若甕城門在左即羊馬城門在右也女牆高可五尺壕面各隨其地為闊狹大要在面闊底狹

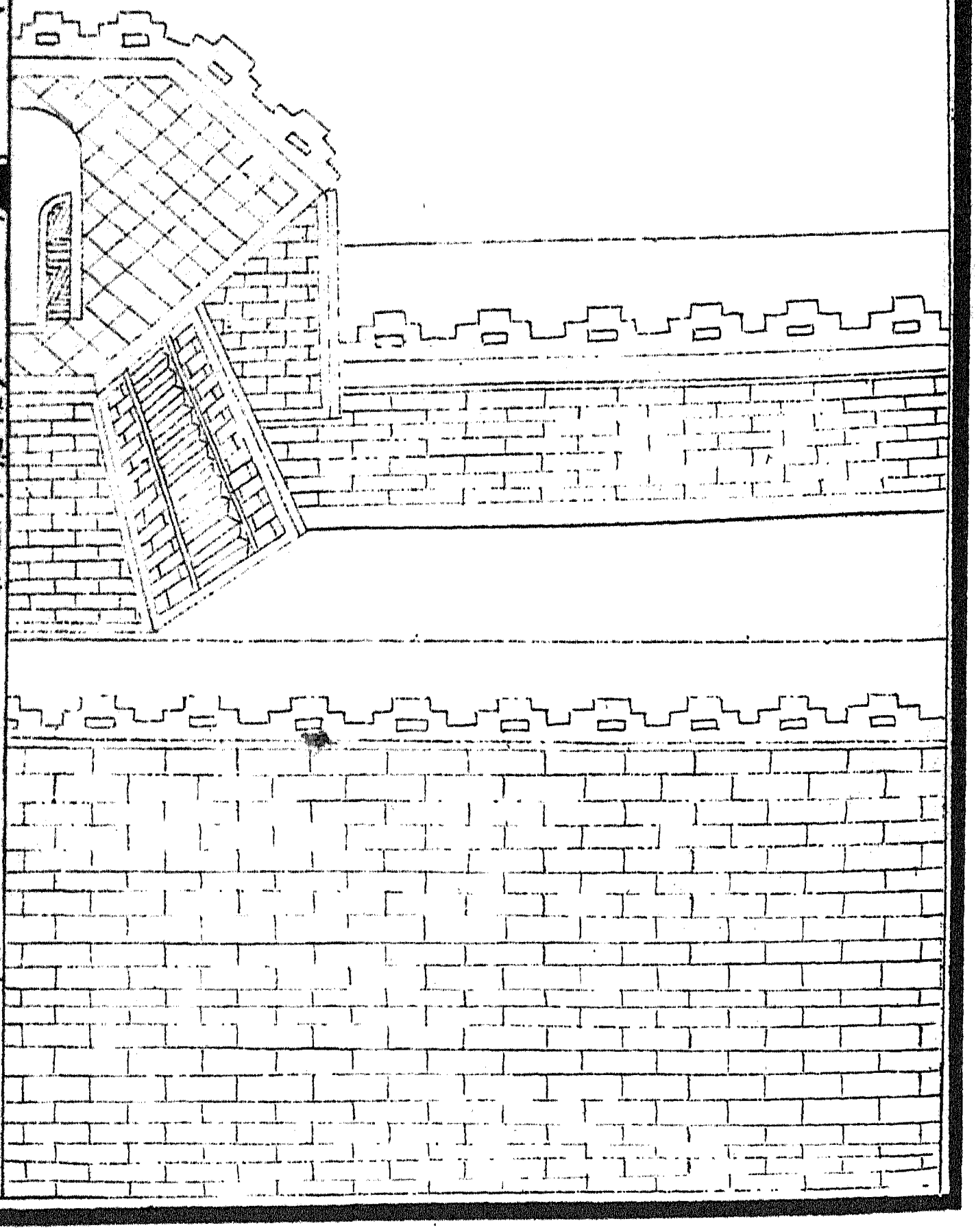
其深及泉使箭砲難及即住
壕橋直對羊馬城門汲水須在城外則甕城
羊馬城各更對開一門以通汲路惟不得對大城門
若依山帶河地勢不便則大城須為偃月形開三門
而已餘不改平陸之制
甕城上各設戰棚其制與敵樓同間數視城之廣狹
其山城則又擇前後左右以去大城近處隨山形別
築一城令與大城相接必盡據高地外亦開塹兩城

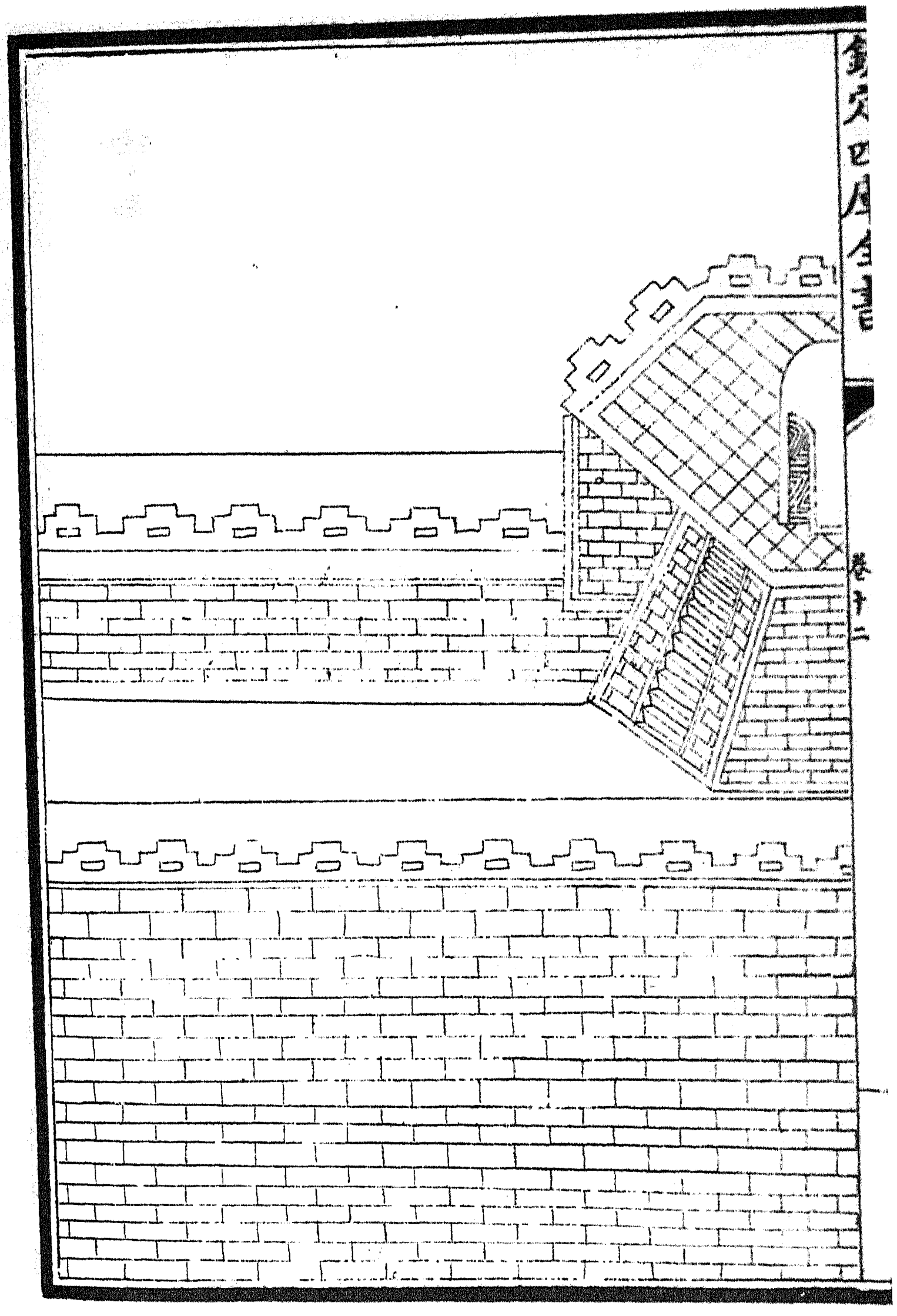
之中或設烽臺以為遠侯賊至即以兵專守免先為
賊所據下窺城中虛實今泰州邠州城皆若是也
一說築城之法每下闊一丈上收四尺凡城高五丈
底闊五丈上收二丈尤堅固矣

城制






弩臺



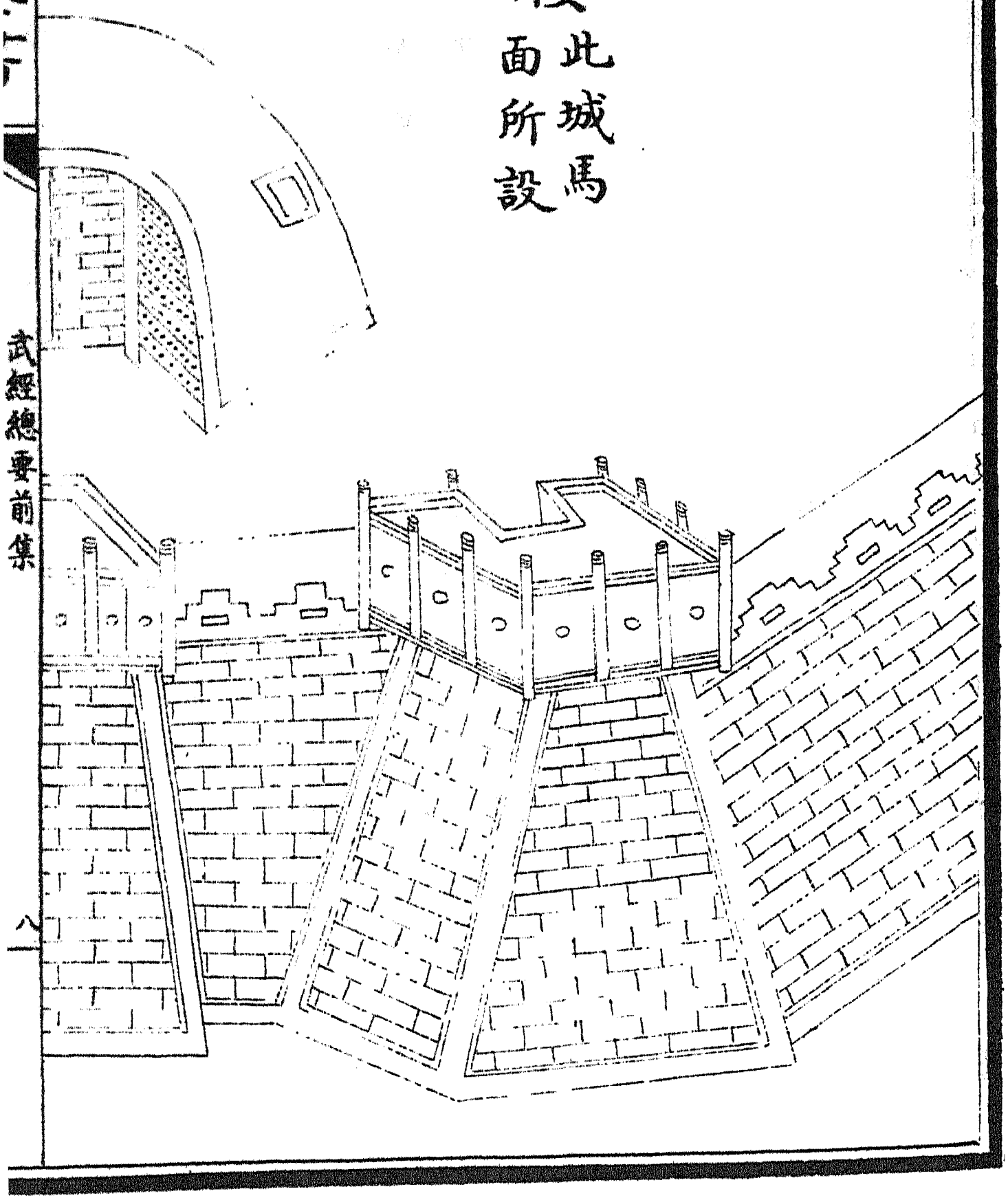
右弩臺上狹下闊如城制高與城等面闊一丈六尺長三步與城相接每臺相拒亦如之上通濶道臺上架屋制如敵棚三面垂以濡氈以遮垂鐘板亦備繩梯內容弩手一十二人棚上三面立牌遮箭棚上亦容弓弩手一十二人隊將一人置五色旗各一鼓一弓弩檑木砲石火鞠等皆蓄之常伺寇至舉旗為表號令臺及城上見之旹舉旗相應寇來自東即舉青旗南舉赤旗西舉白旗北舉黑旗已來復還舉黃旗寇

來漸近則望其主將發弩叢射之其砲檑用如城上

法

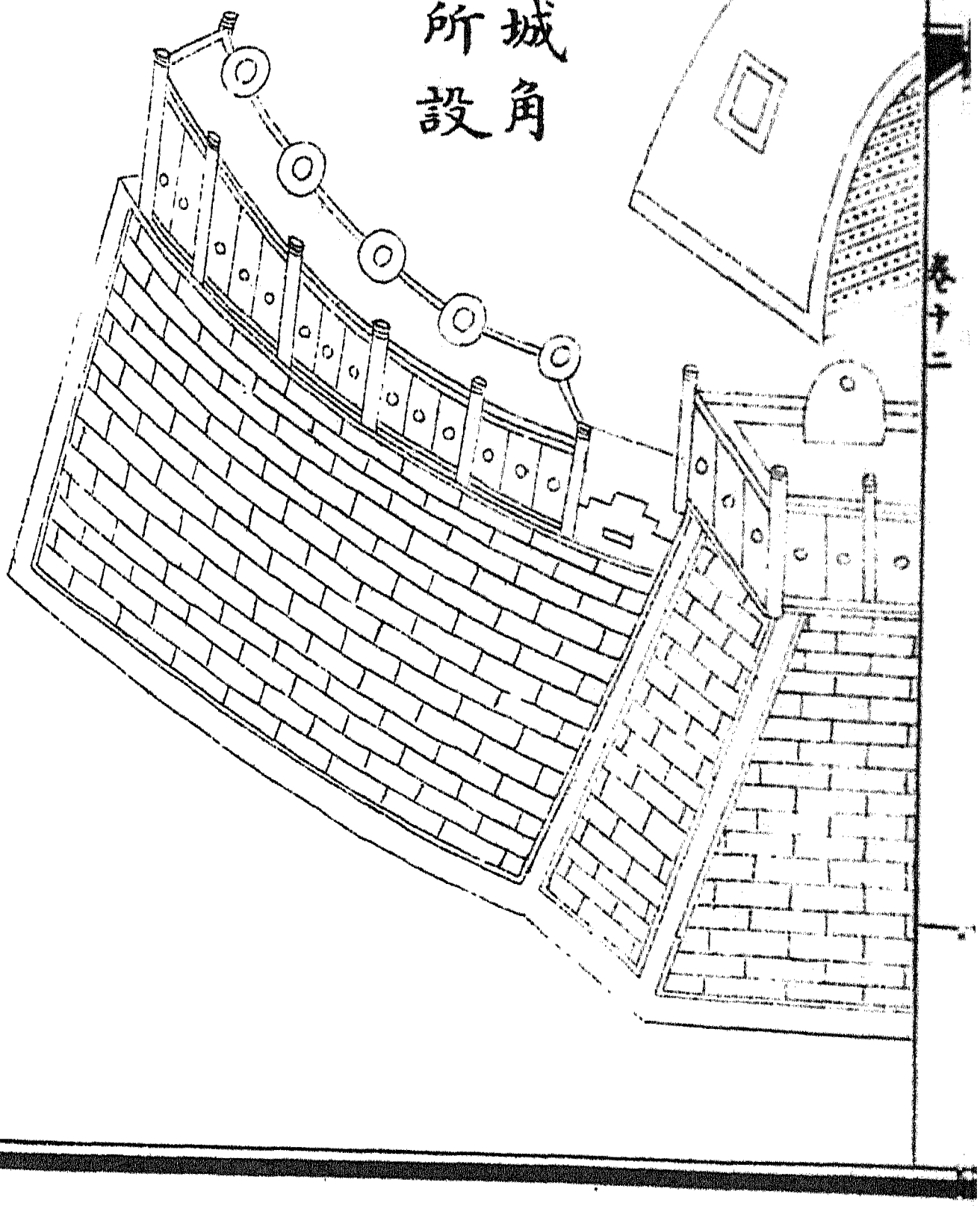
白露屋

敵樓此城馬面所設



圍樓

此城角圍所設



右白露屋以江竹或榆柳條編如窮廬狀外塗石灰有門有竅中容一人以為候望每敵樓戰棚上五間置一所於兩傍施木柜馬篦籬笆隱人於下持泥漿麻楮以備火攻

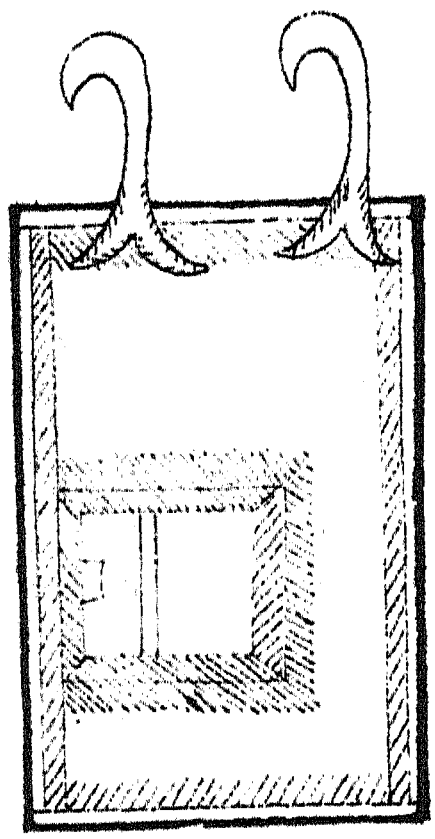
敵樓前高七尺後五尺每間闊一步深一丈其棚上下約容二十人若城愈闊則愈深上施楮頭木中設雙柱下施地栿仍前出三尺常法一間二柱此用四柱以備矢石所摧上密布楸覆土厚三尺加石灰泥

之被以濡氈及楸枕之首並以牛革裹之以防火箭
敵樓之制與戰棚同

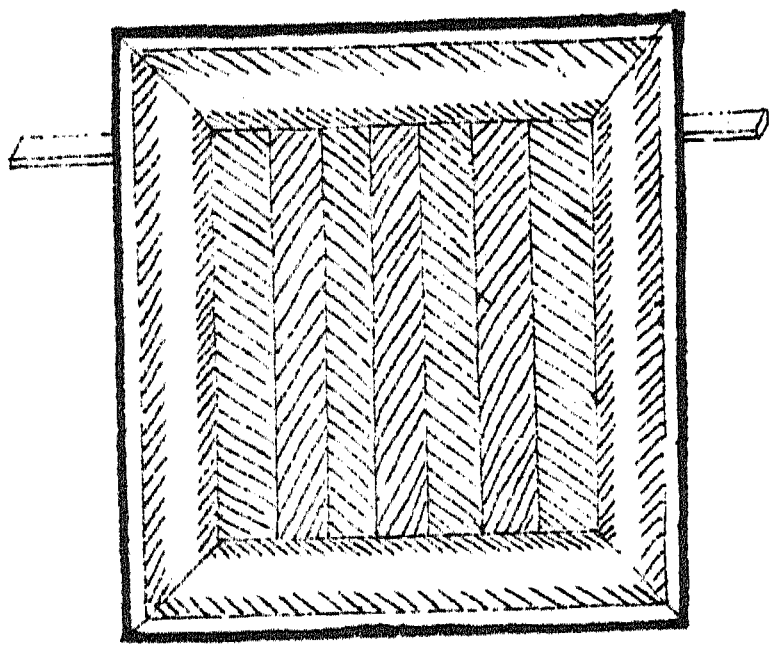
釣橋

右釣橋造以榆槐木其制如橋上施三鐵環貫以二鐵索副以麻繩繫屬於城樓上橋後去城約三步立二柱各長二丈五尺開上山口置熟鐵轉輸為槽以架鐵索并繩貴其易起若城外有警則樓上使人挽起以斷其路亦以護門城上常以砲及弓弩禦敵慮以火燔燒及被攻斫

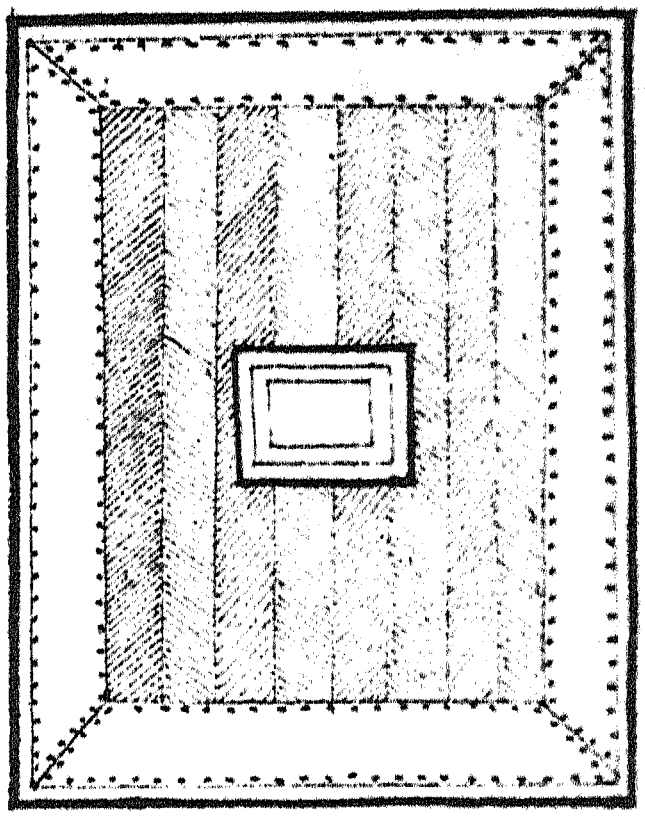
垂鐘板



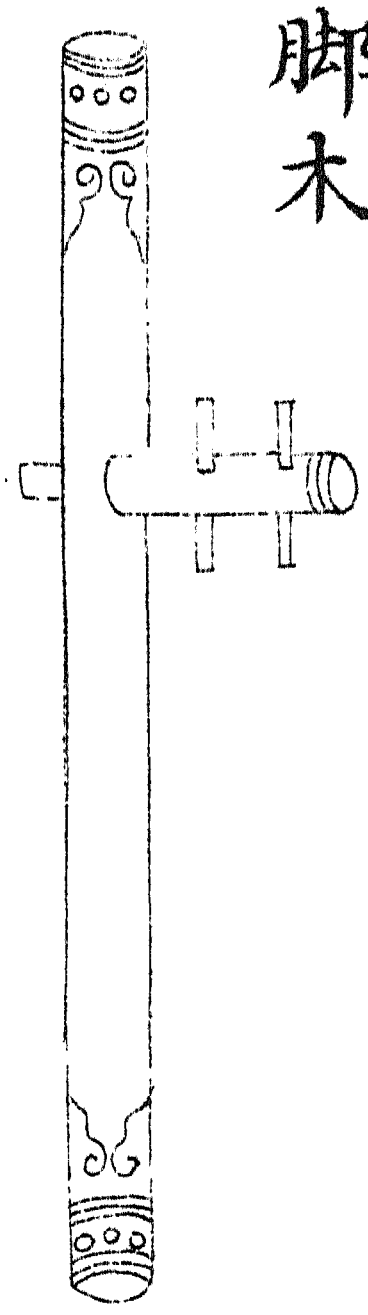
籬　　罳



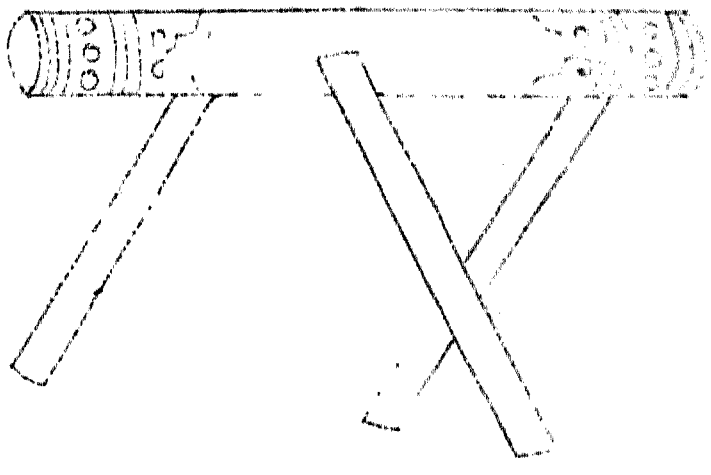
竹皮笆



狗脚木



木馬子



右垂鐘版長六尺闊一尺厚三寸用生牛皮裹開箭牕

施於戰棚前後有伏兎拐子木

篦籬笆以荆柳編成長五尺闊四尺漫以生牛皮背

施横竿長六七尺用於戰棚上則以木馬倚之在女

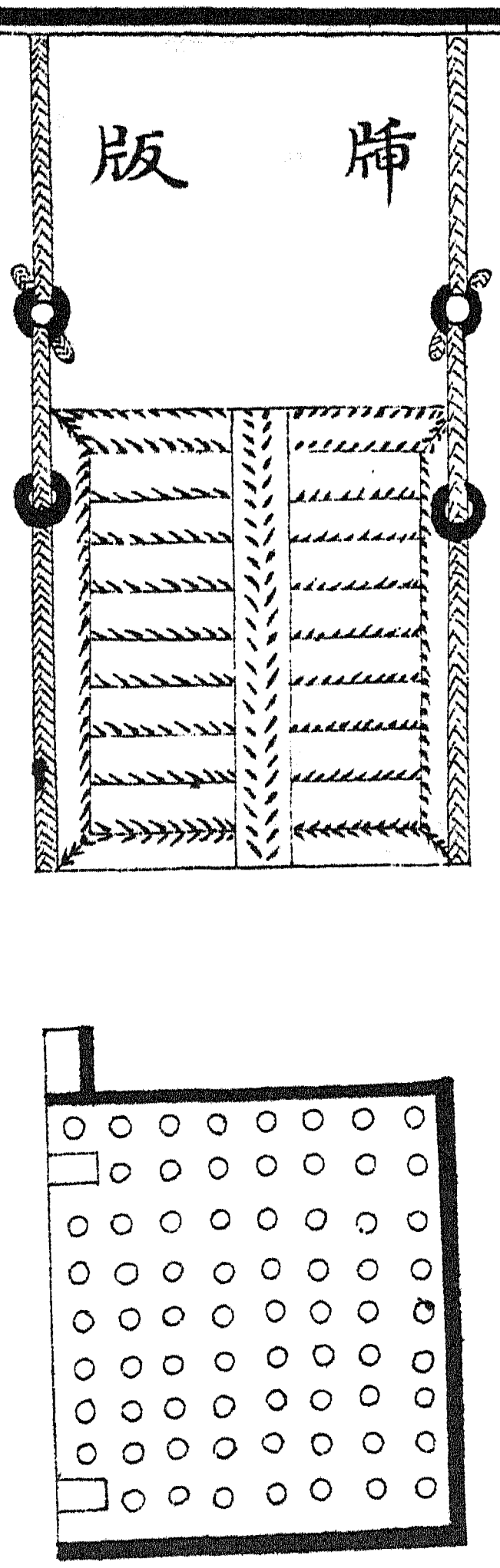
牆外以狗脚木掛之

皮竹笆以生牛皮條編江竹為之高八尺闊六尺施

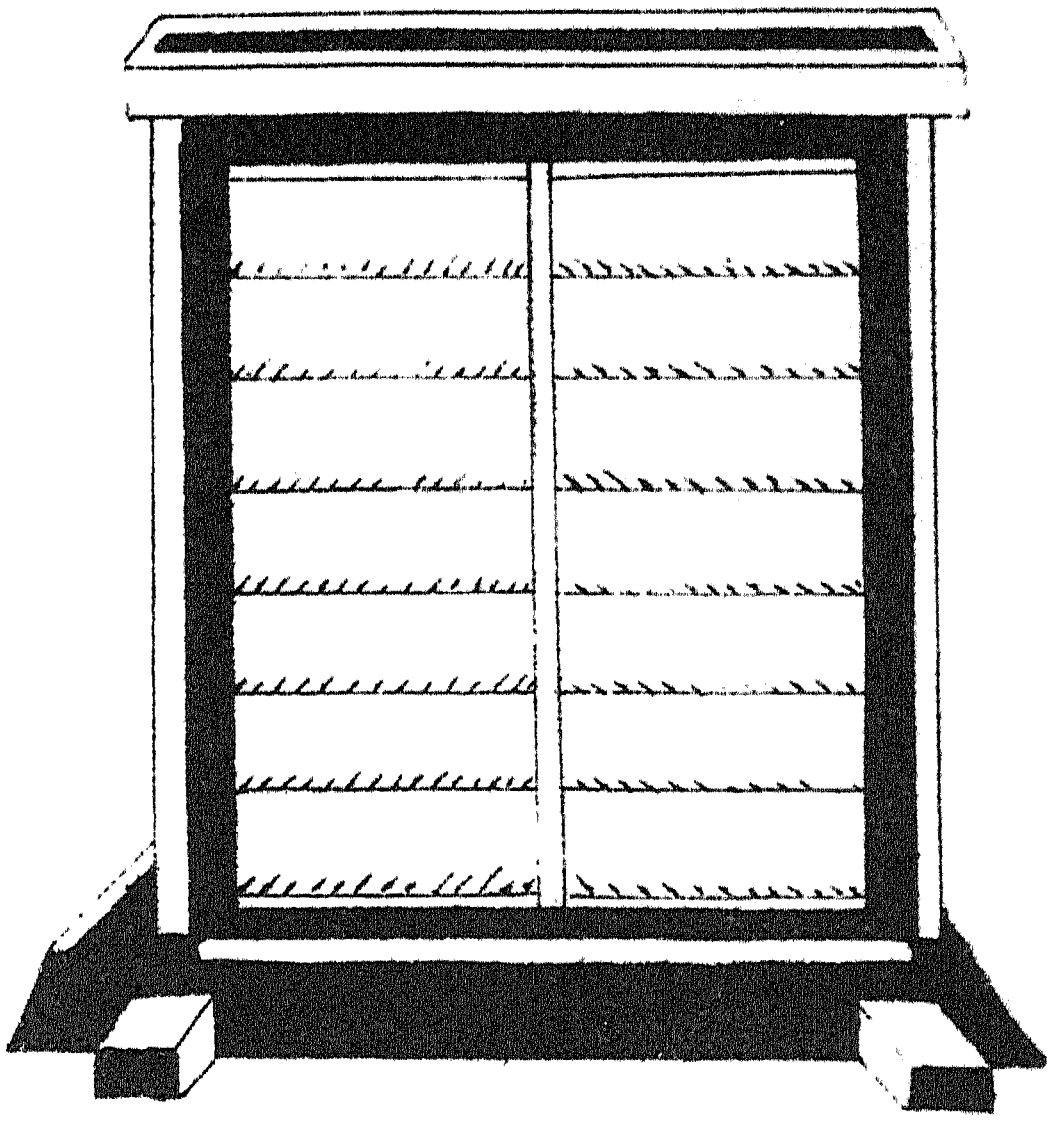
於白露屋兩邊以木馬倚定開箭窻可以射外

木馬子一横木下置三足高三尺長六尺

狗脚木植二柱於女牆内相去五尺準牆為高下柱上施横木鈎掛


牐版

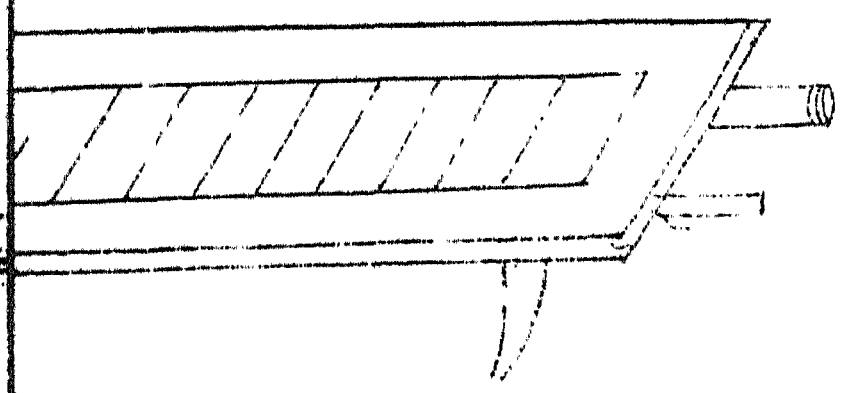
暗門



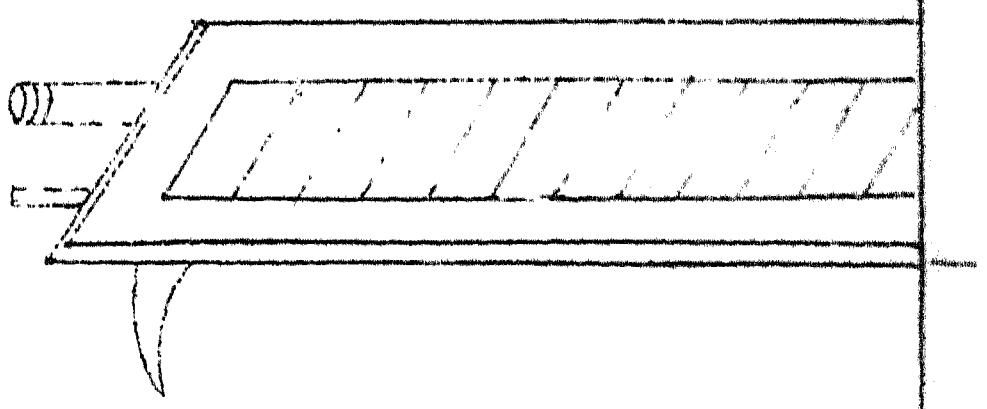
右牌版與城門為重門其制用榆棋木廣狹準城門漫以生牛皮裹以鐵葉兩傍施鐵環貫鐵凡大城門去門闕五尺立兩頰木木開池槽亦用鐵葉裹之若寇至即以絞車自城樓上抽所貫鐵索下牌版于槽中外實以土防火攻內枝以柱防傾折一說不用牌版則鑿門數十孔敵逼城開門則出矛戟以彊弩射之謂之鑿扇暗門更於兵出入便處潛鑿城為門外存尺餘勿透以備出兵襲敵其製高七尺闊六尺內施排

沙柱上施橫木搭頭下施門閫常伺敵間出奇兵以
襲擊之仍於城上多積巨石及虞敵人犯門即下石
擊而斷之

陷馬坑



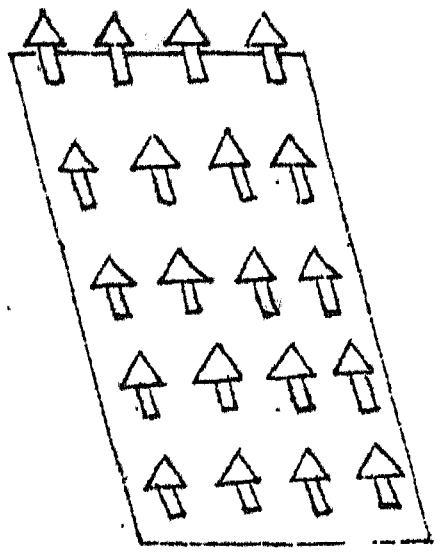
陷馬坑



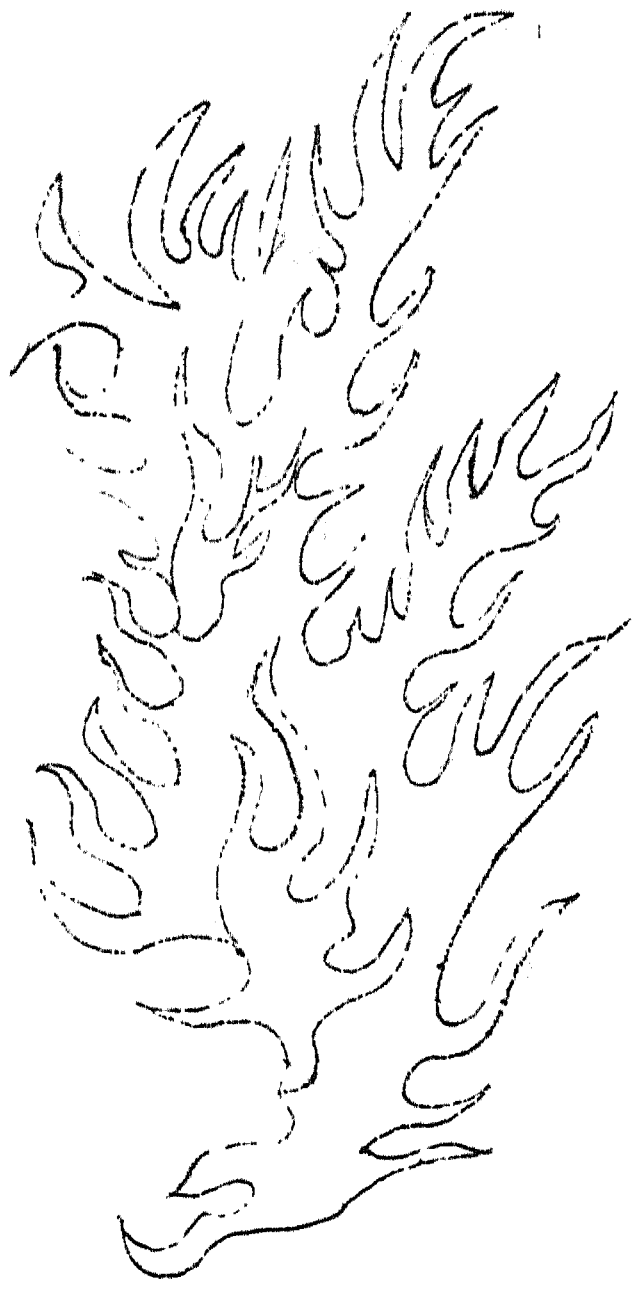
右陷馬坑長五尺闊三尺深四尺坑中植鹿角槍竹簽二物皆削尖入火令堅其坑排如卜字或解鎗為之覆以芻草或上種草苗務令敵人不覺凡敵來路及城門內外皆設之

機橋用一梁仍為轉軸兩端橫施桔置溝壕上賊至即去桔人馬踐之則翻

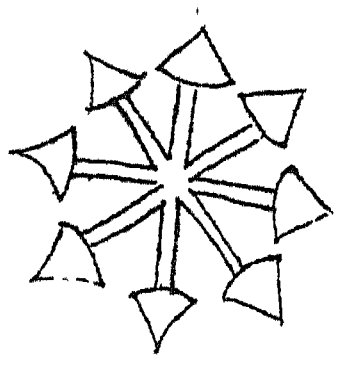
地澁

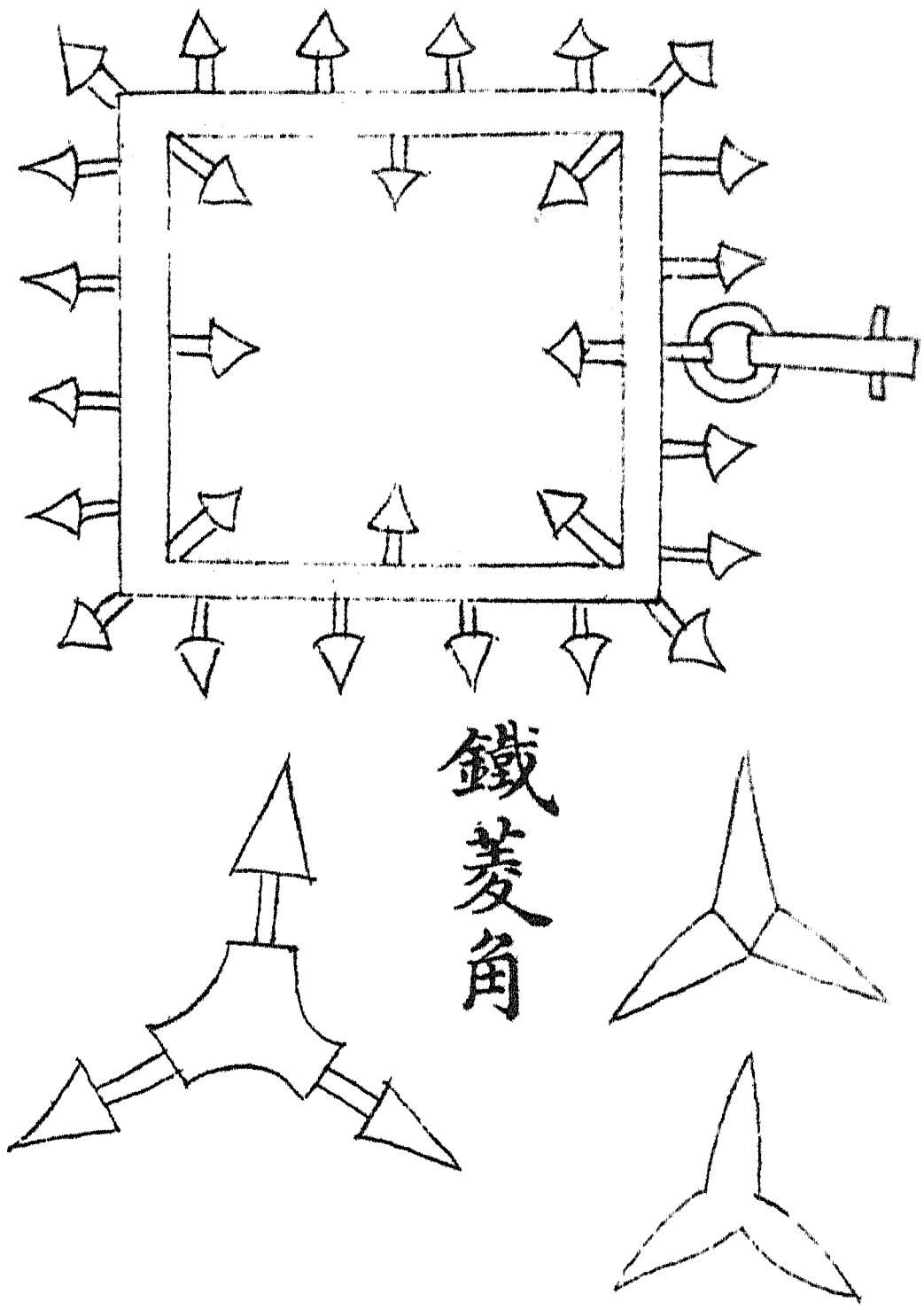


鹿角木



鐵蒺藜




搊蹄
鐵菱角

右鐵菱角如鐵蒺藜布水中刺人馬足

鹿角木擇堅木如鹿角形者斷之長數尺埋入地深尺餘以鬬馬足

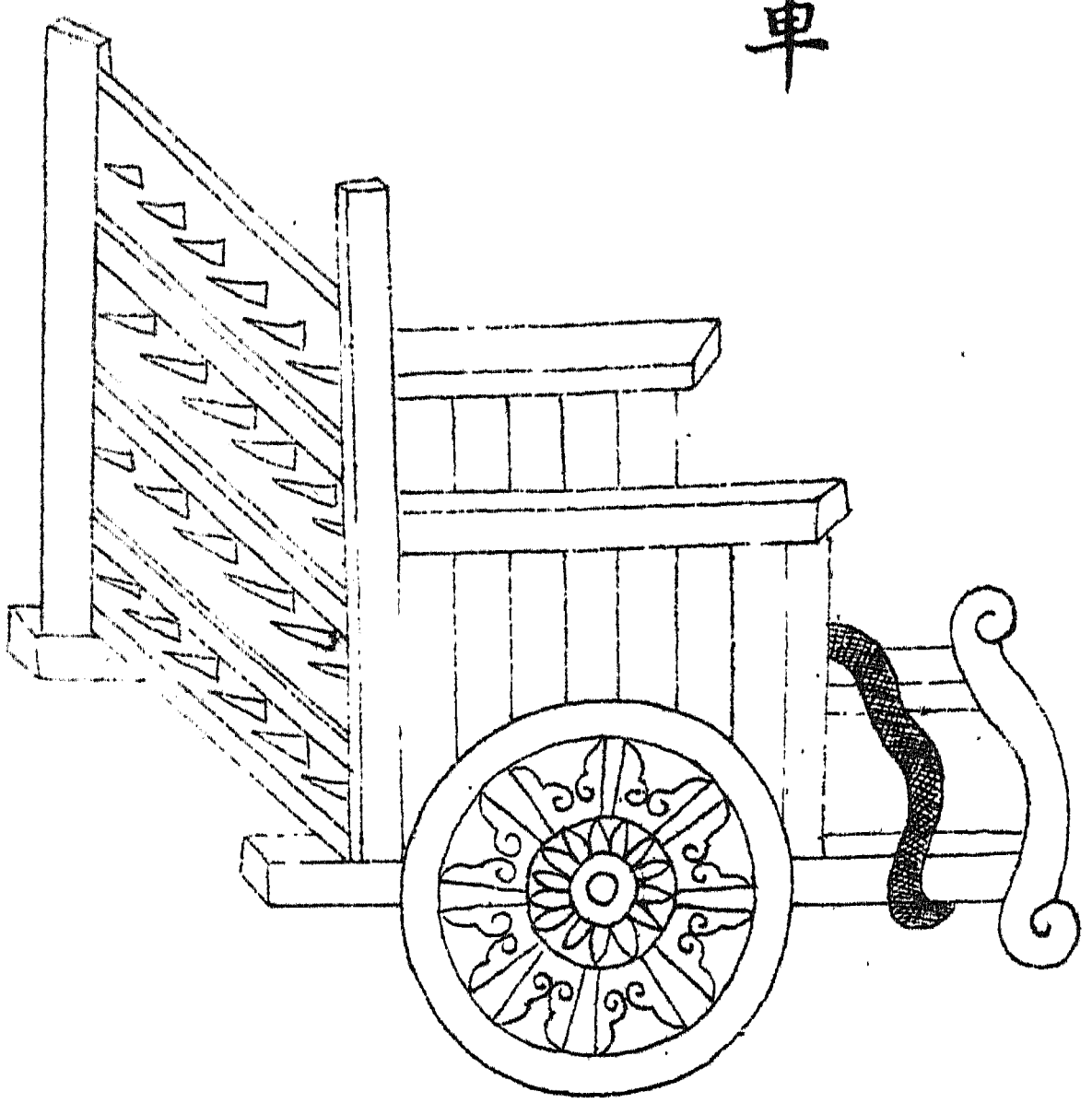
地漉以逆鬚釘布版厚三寸長鬬約三二尺鐵蒺藜並以置賊來要路使人馬不得騁古所謂渠搭也

撠蹄鬬四木為方形徑七寸中橫施鐵逆鬚釘其上亦攔馬之具

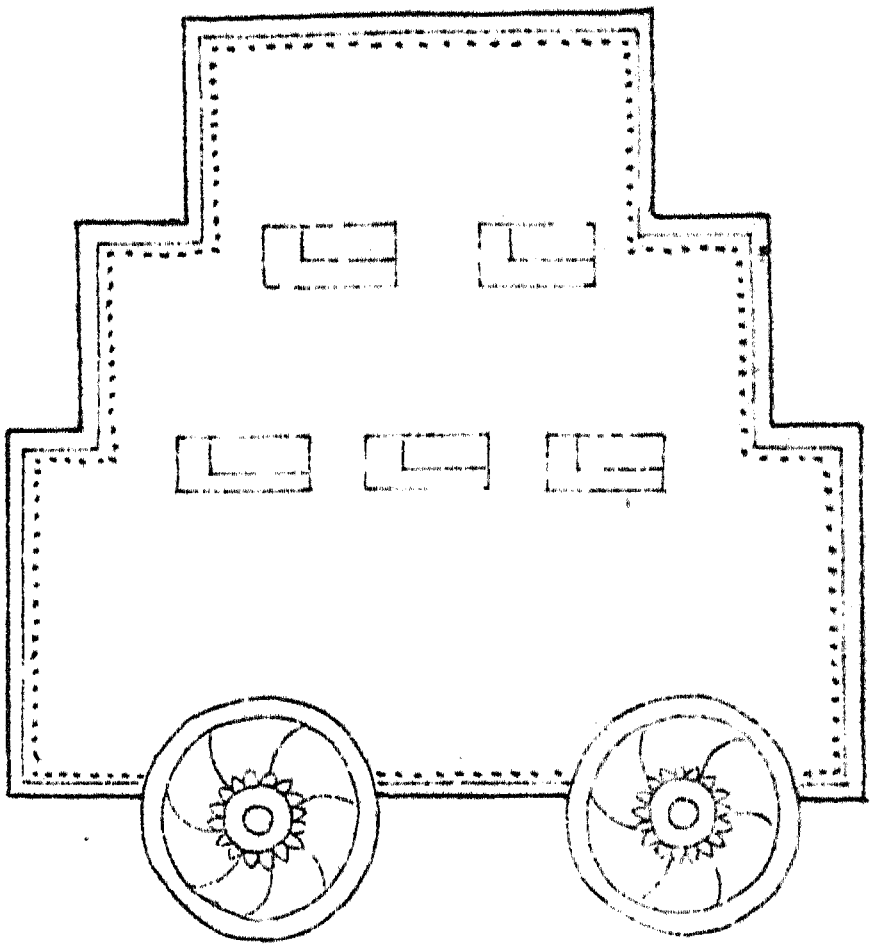
木蒺藜以三角重木為之

凡壕中遇天旱水淺則布鐵菱角于水中城外有溪
陂可絶者亦布之大城外遍植鹿角木

塞門刀車

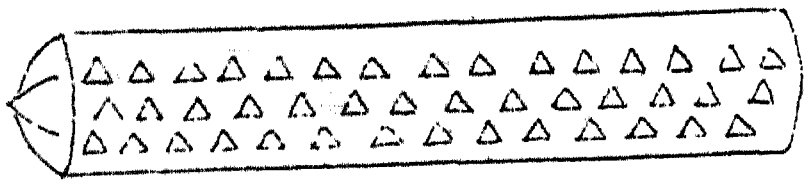


木女頭

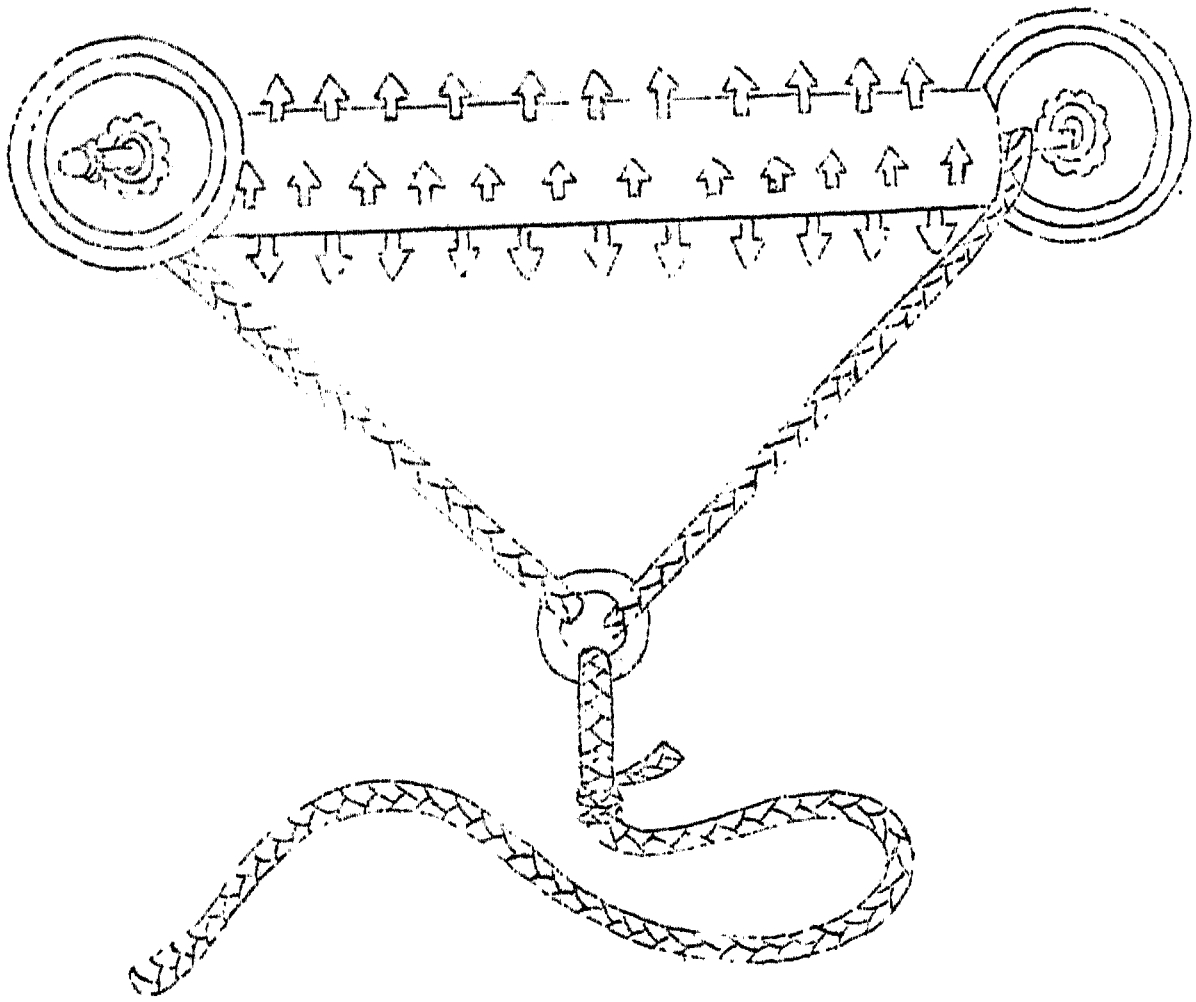


刀車以兩輪車自後出鎗刃密布之凡為敵攻壞城門
則以車塞之
木女頭形制如女牆以版為之高六尺闊五尺下施兩
輪軸施拐木二條凡敵人攻城摧壞女牆則以此木
女代之

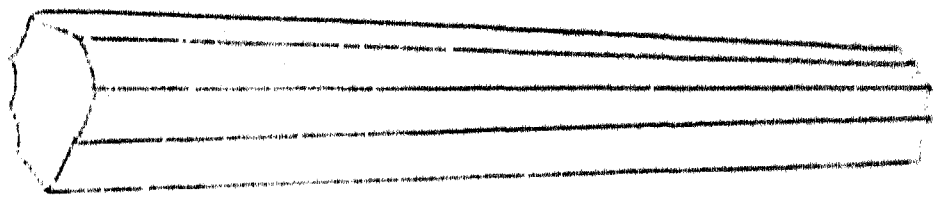
木檑



夜叉檑

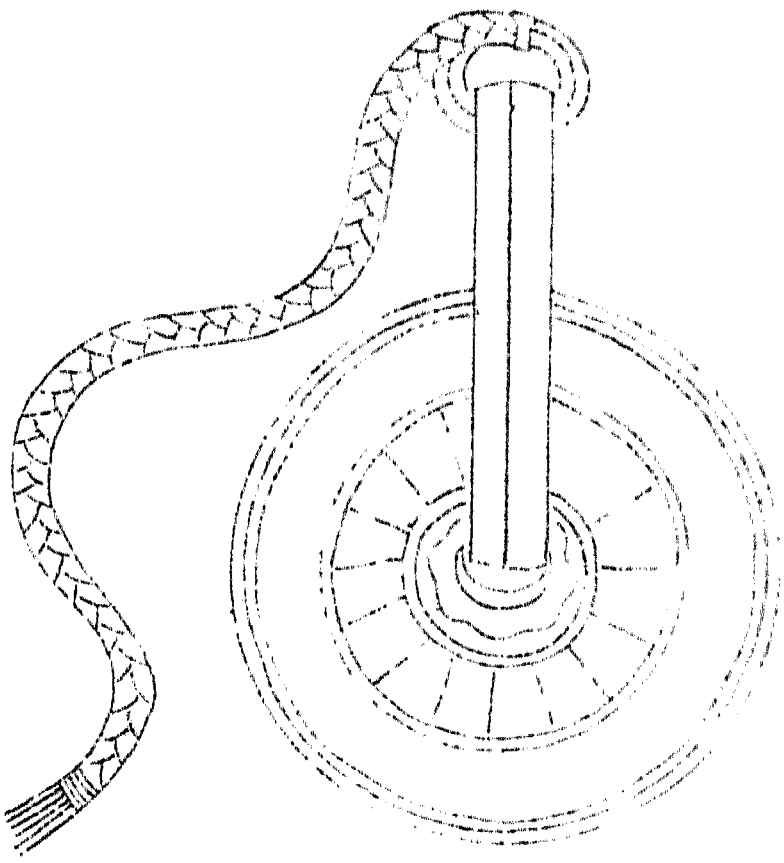


槌塼



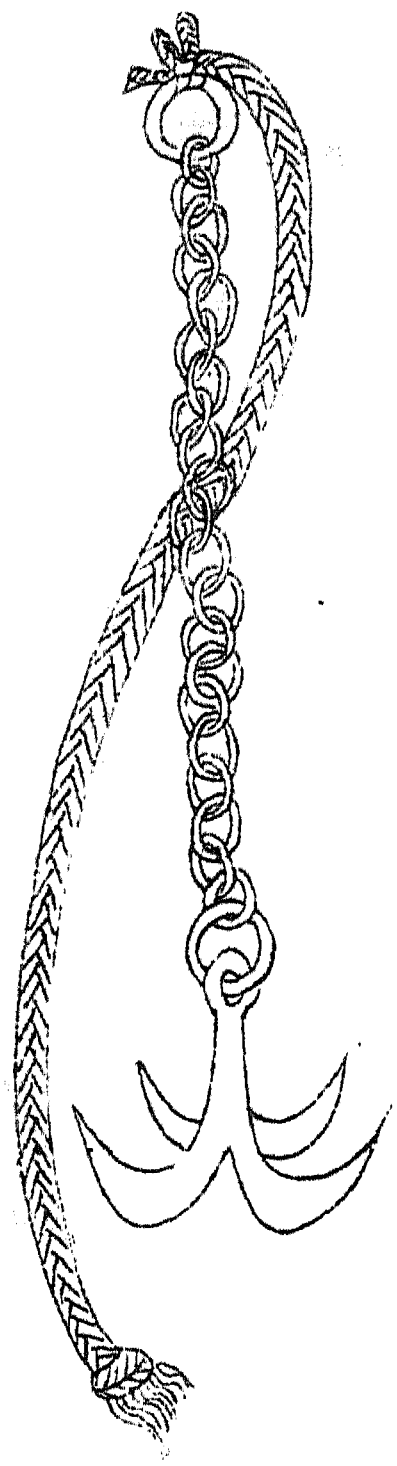
槌泥

車腳槌

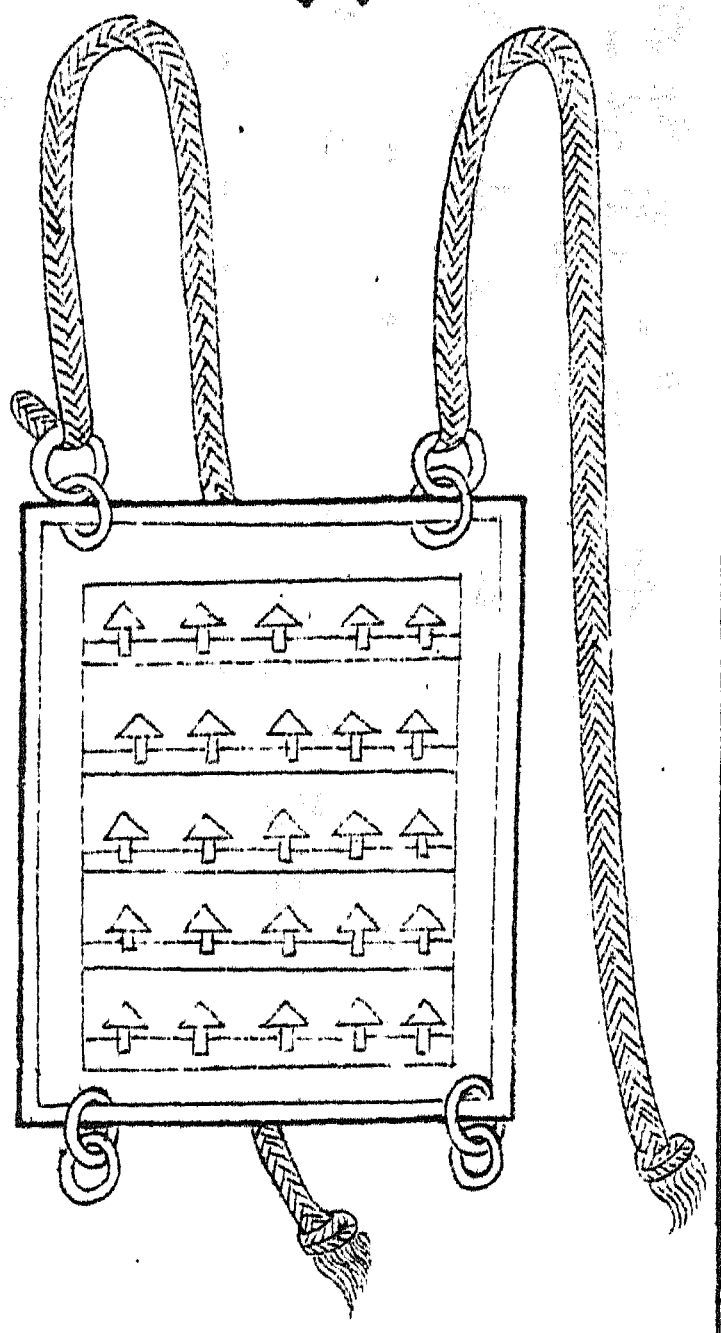


右木檑以木體重者為之長四尺徑五寸
泥檑用緊慢土調泥入猪髮毛馬尾毛鬣三十斤搗
熟捍成長二三尺徑五寸
塼檑如檑形燒塼為之長三尺五寸徑六寸
車腳檑以繩繫獨輪以絞車放下復收
夜又檑一名留客住用濕榆木長一丈許徑一尺周
回施逆鬚出木五寸兩端安輪腳輪徑二尺以鐵索
絞車放下復收並以擊攻城蟻附者

飛鈎



狼牙拍

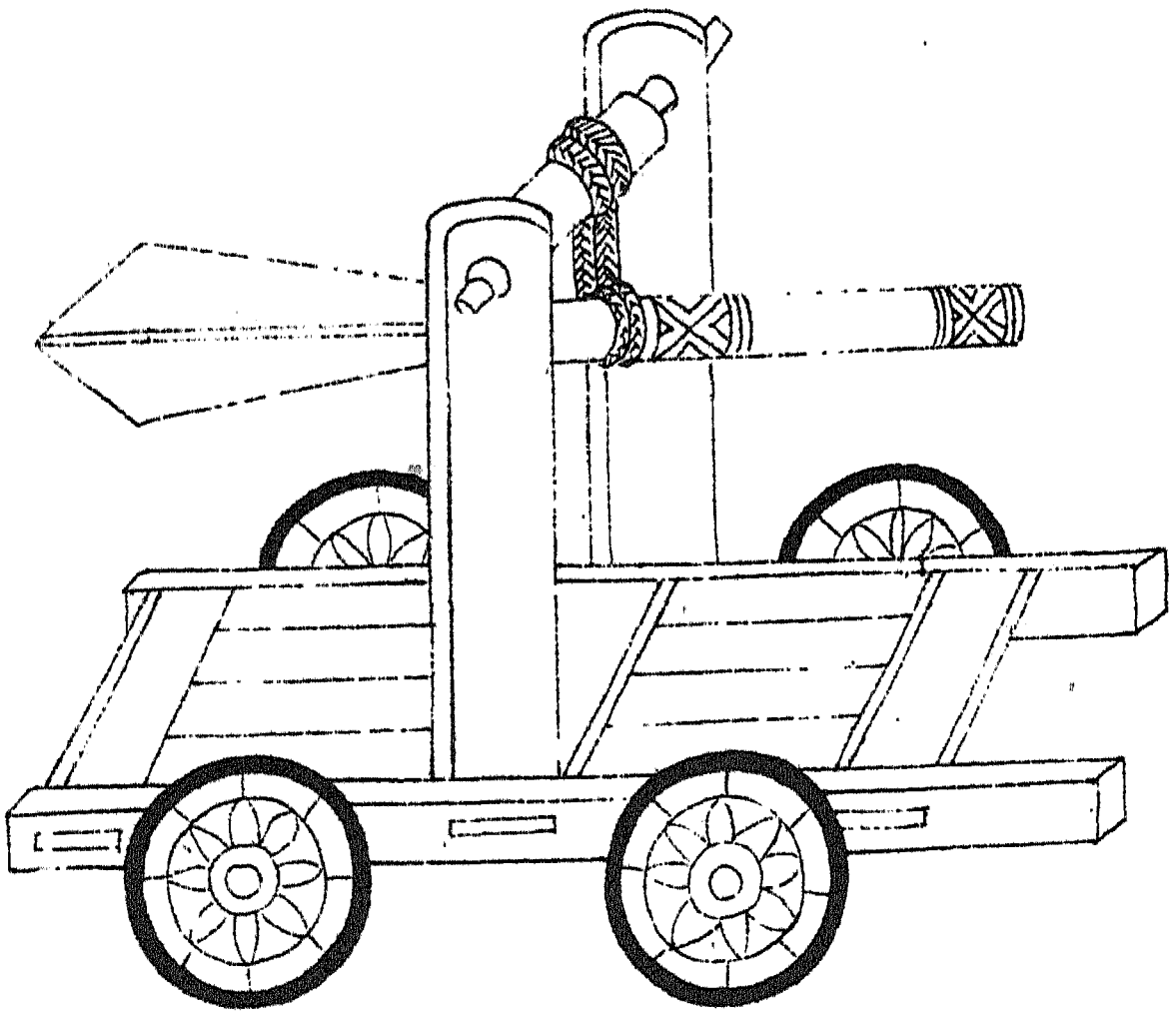


右狼牙拍合榆木爲箕長五尺闊四尺五寸厚三寸以狼牙鐵釘二千二百箇皆長五寸重六兩布釘于拍上出木三寸四面施一刃入木寸半前後各施二鐵環貫以麻繩鉤于城上敵人蟻附登城則使人掣起下而拍之

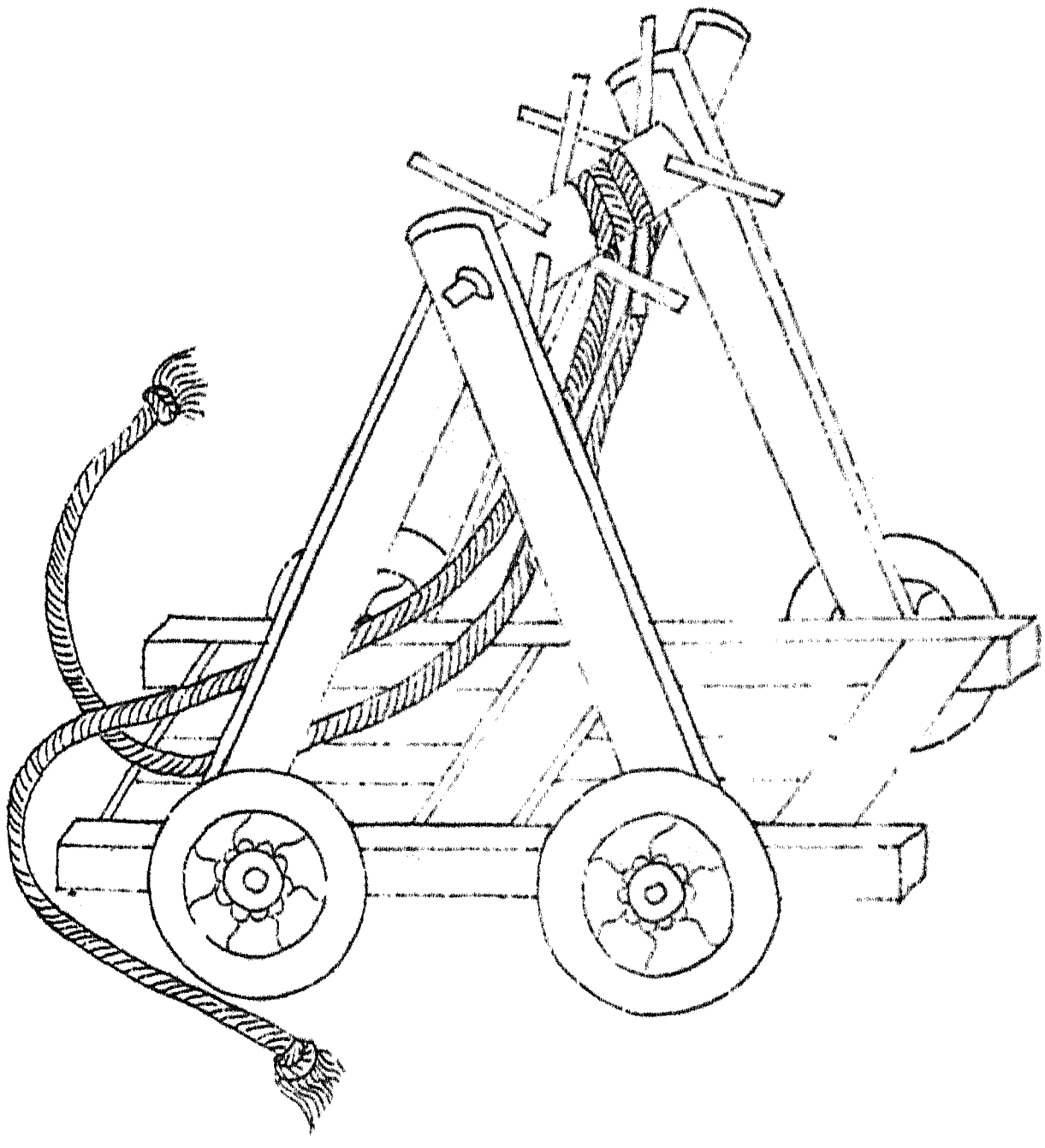
飛鉤一名鐵鴟脚鉤鋒長利四出而曲貫鐵索以麻繩續之凡敵人被重甲頭有鍪笠又畏矢石不得仰視候其聚處則擲鉤于稠人中急牽挽之每鉤可取三

兩人

撞車



紋車

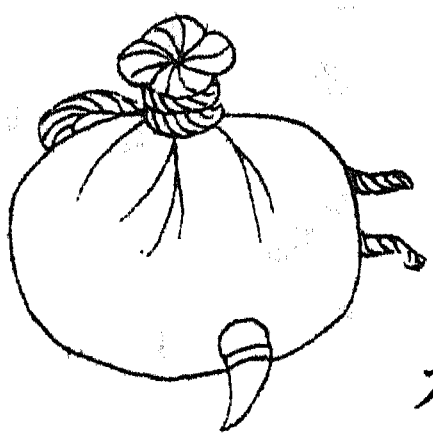


右絞車合大木為床建二叉手柱上為絞車下施四車
輪皆極壯大力可挽二千斤凡飛梯木幔逼城使善
用搭索者遥拋鉤索掛及梯幔併力挽令近前即以
長竿舉大索鉤及而絞之入城如絞木驢待其逼城
且擲大木檑石擊之次下小石勿絶使木驢内驚懼
人不敢出則使二壯士坐及屋中自城上設轆轤繫
鐵索縋至木驢上二人俱出引絞車鉤索掛搭木驢
畢復拽上即速絞出入城

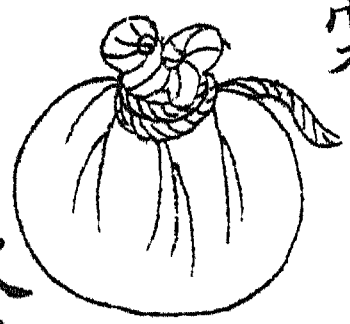
皮屋以鐵棬為質生牛革裹之開出入竅可容二壯士

撞車上設撞木制如榨油撞法以鐵葉裹其首逐便移徙伺飛梯臨城則撞之

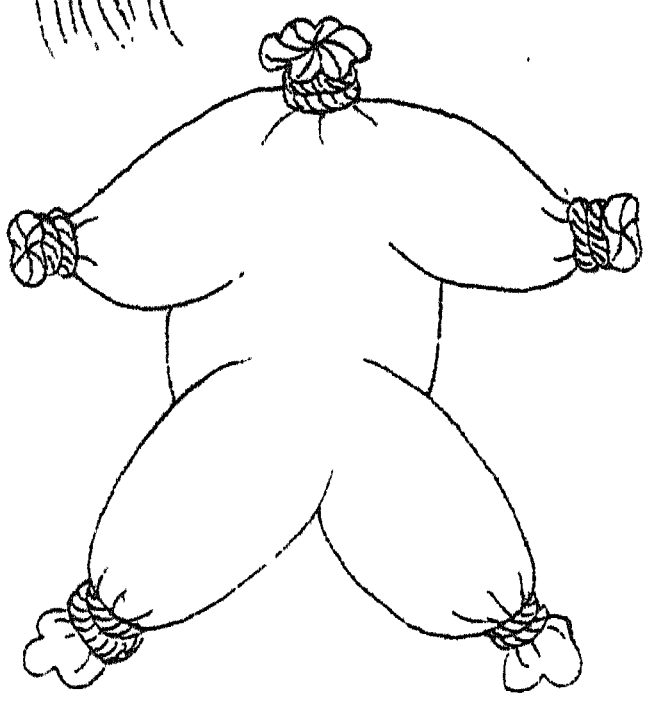
水囊



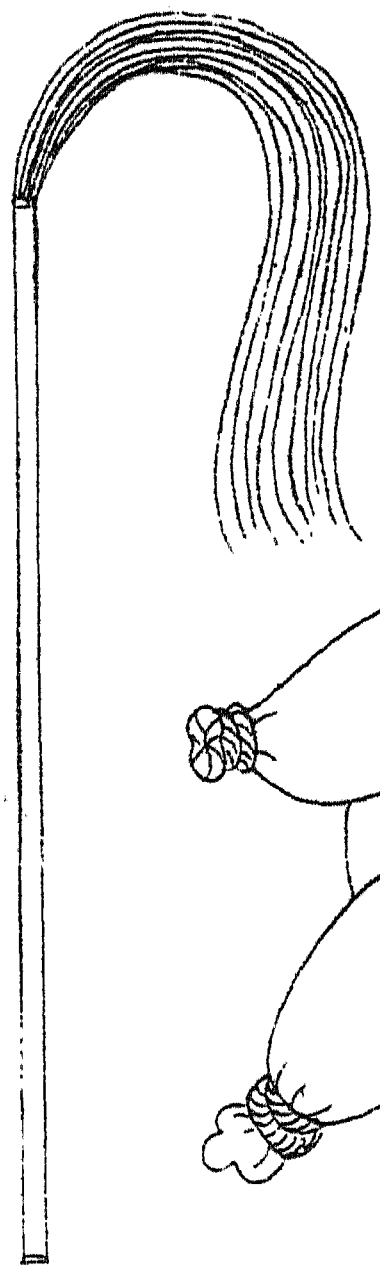
水囊



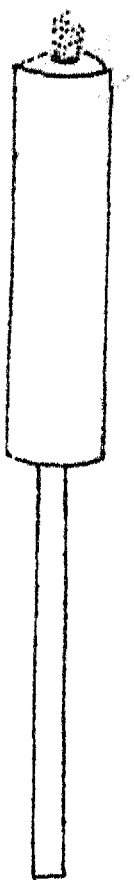
水袋



麻搭



唧筒

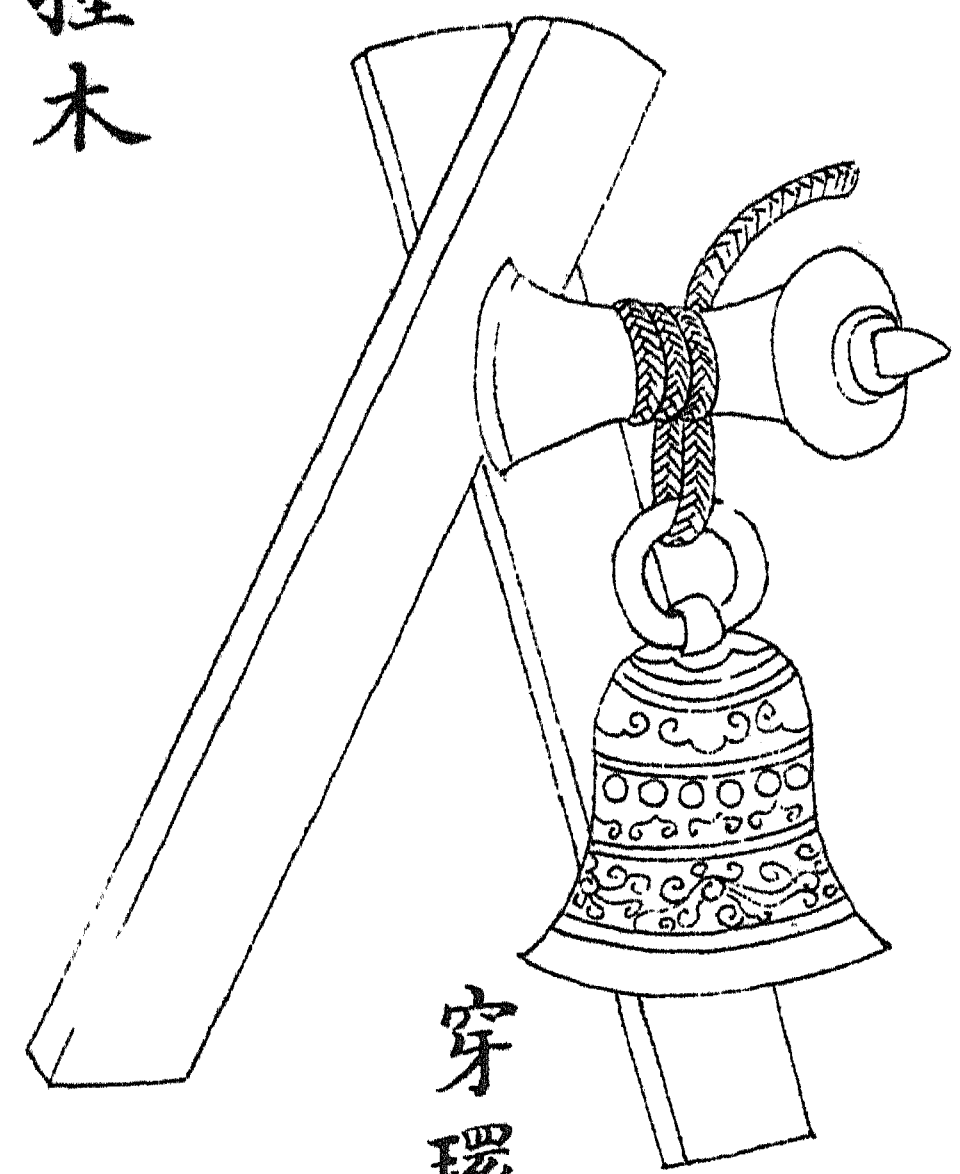


右水袋以馬牛雜畜皮渾脫為袋貯水三四石以大竹一丈去縛于袋口若火焚樓棚則以壯士三五人持袋口向火爇水注之每門置兩具

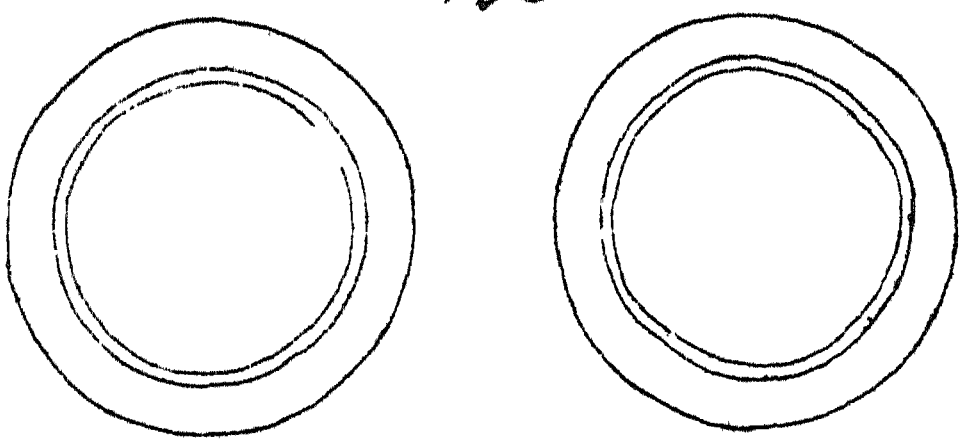
水囊以猪牛胞盛水敵若積薪城下順風發火則以囊擲火中古軍法作油囊亦便

唧筒用長竹下開竅以絮裹水桿自竅唧水麻搭以八尺桿繫散麻二斤蘸泥漿皆以爇火

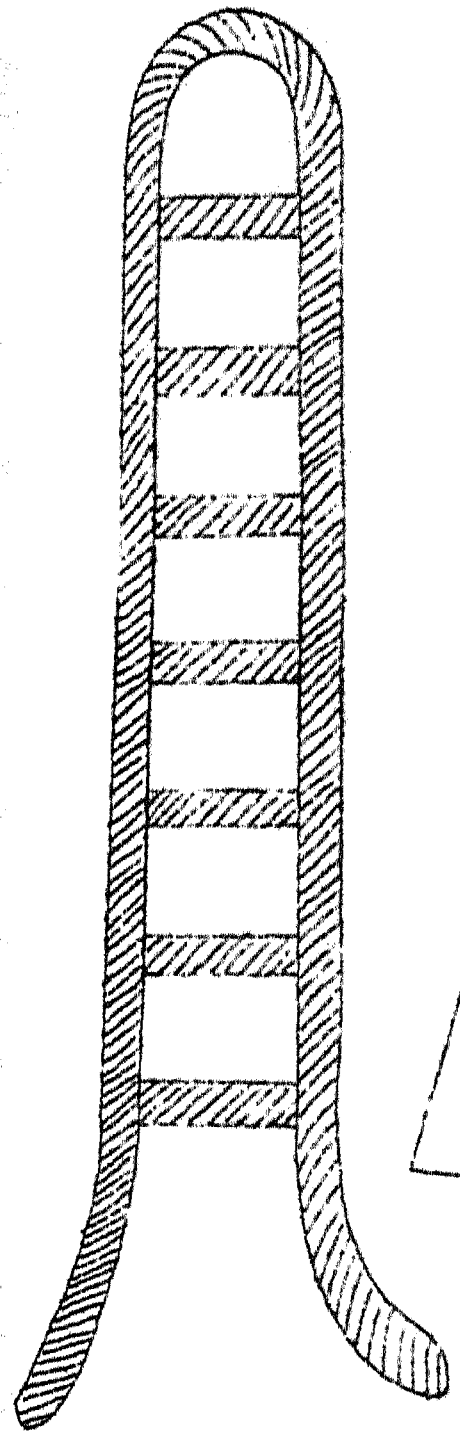
鐵撞木



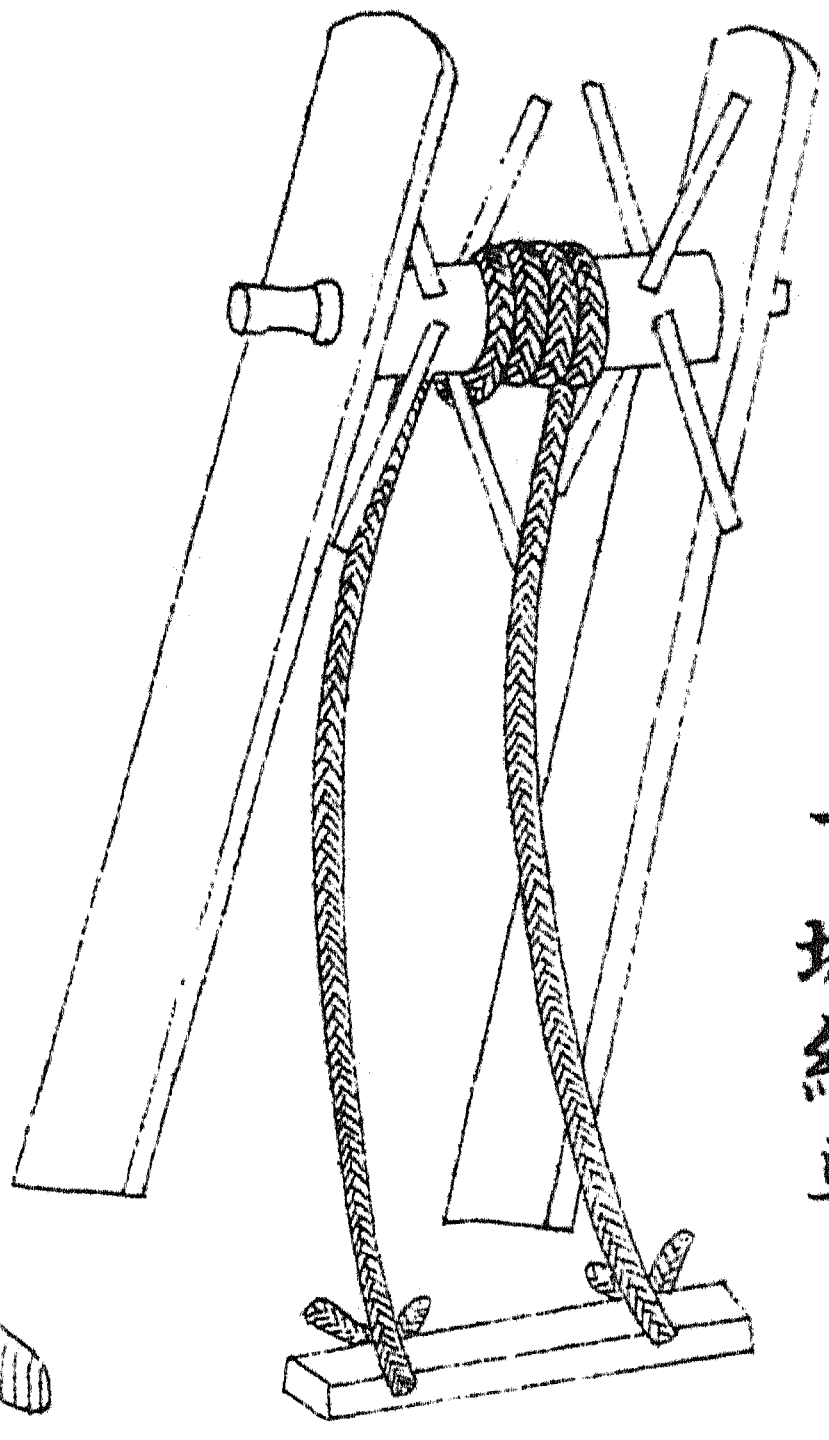
穿環



繩梯



下城絞車

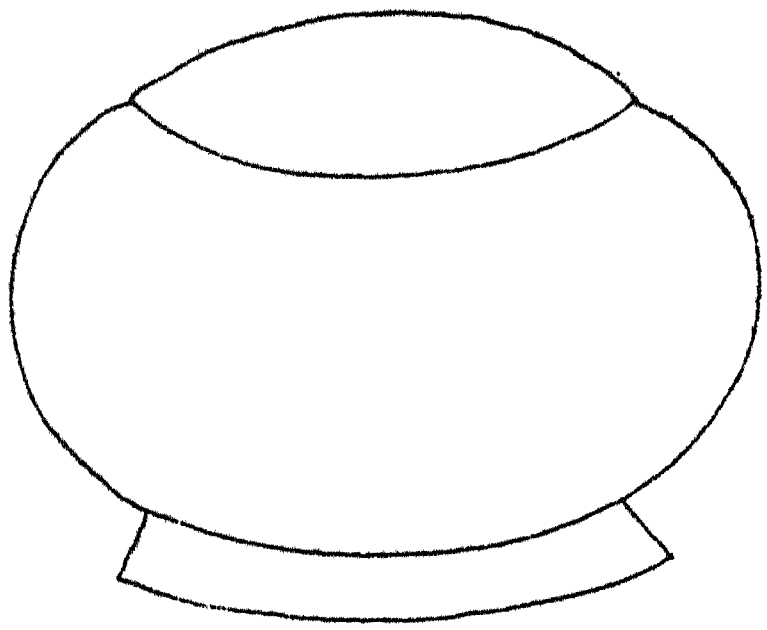


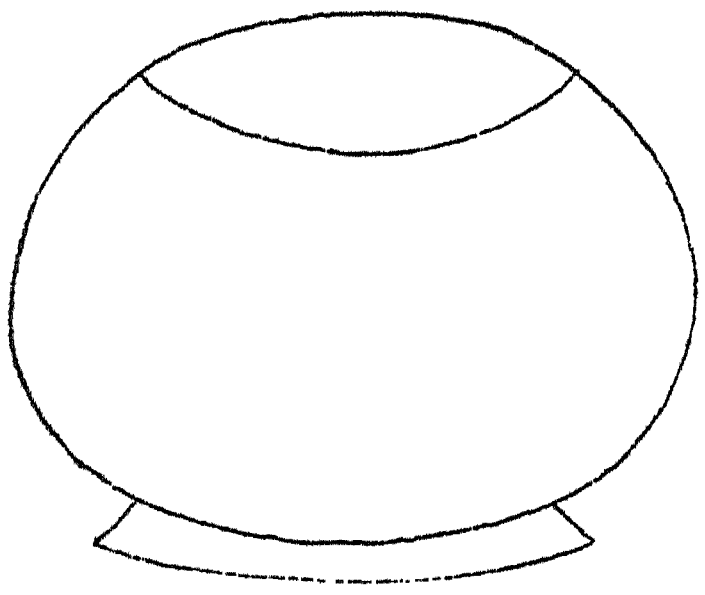
鐵撞木木身鐵首其首六鐵鋒鋒大三指長尺餘鋒尖
為逆鬚其末貫鐵索凡木驢逼城即自城上以轆轤
絞鐵撞下而斲之皮革皆壞乃下燕尾炬燒之
穿環鍛鐵或屈柔腮木為大環以索繫之則用撞車
及城則舉環穿掛車一人併力挽繩隨以弓弩兩傍射
之其車必翻射仍勿止車下人多不披甲當遁走急
趨健卒攘斬翦以焚之
絞車立兩頰木橫施轉軸施十字絞木垂兩繩下貫

庸版乘之上下

繩梯以巨繩繫橫栈為軟梯凡登高則用之

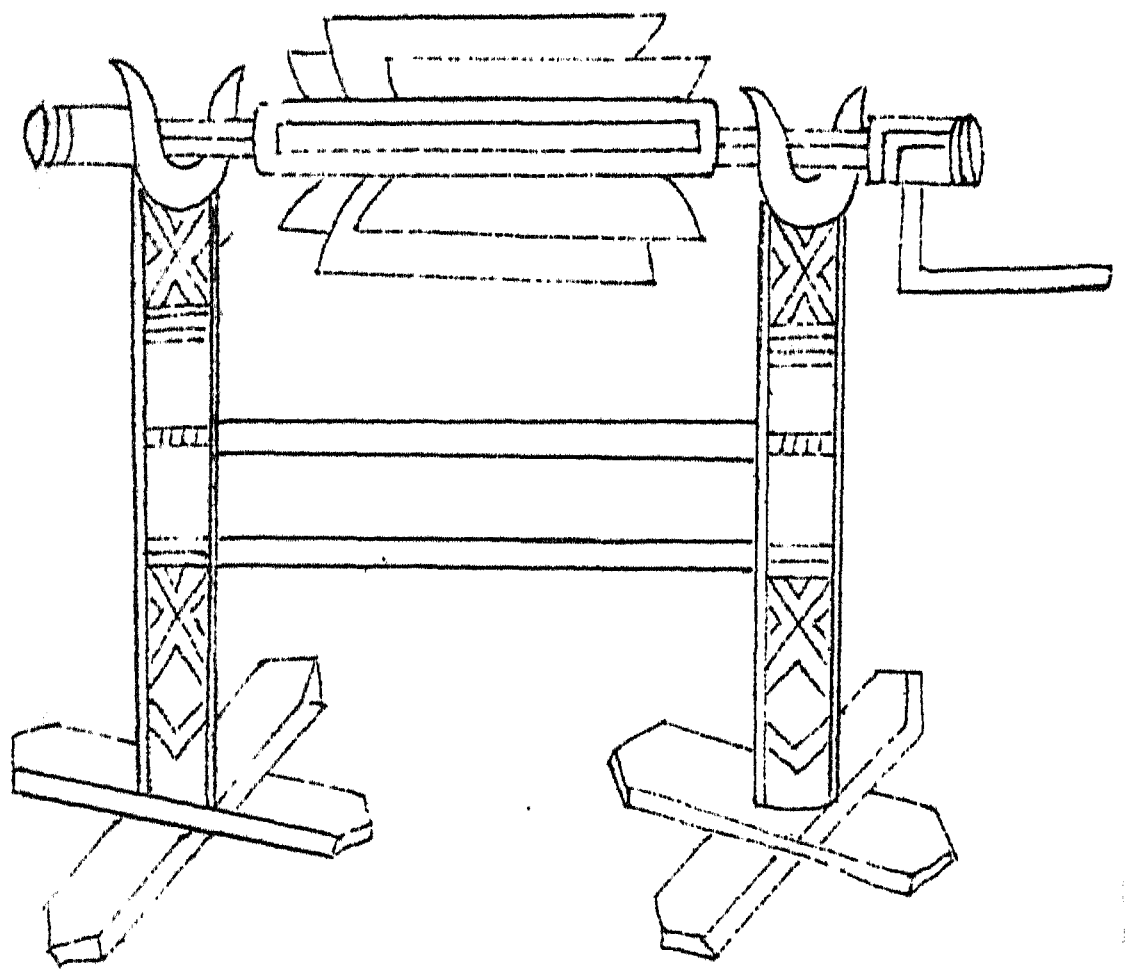
甕　聰





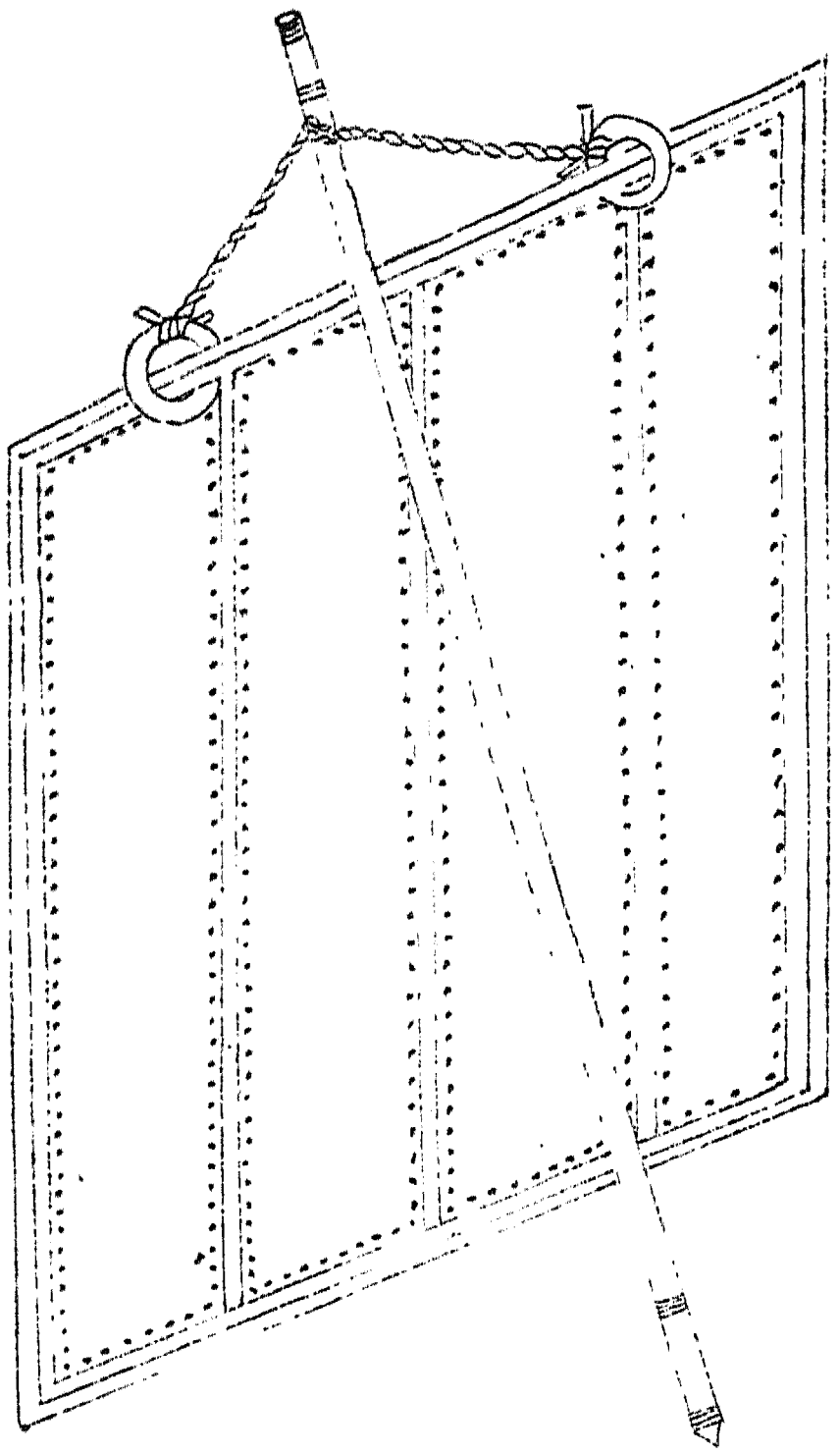
右甕聽用七石甕覆于地道內擇耳聰人坐聽於甕下以防城中鑿地道迎我若賊開地道迎我則急以霹靂火毬具守城門毒藥煙毬具攻門熏灼之其樺燭鐵燈籠皆用地道中點照

風扇車



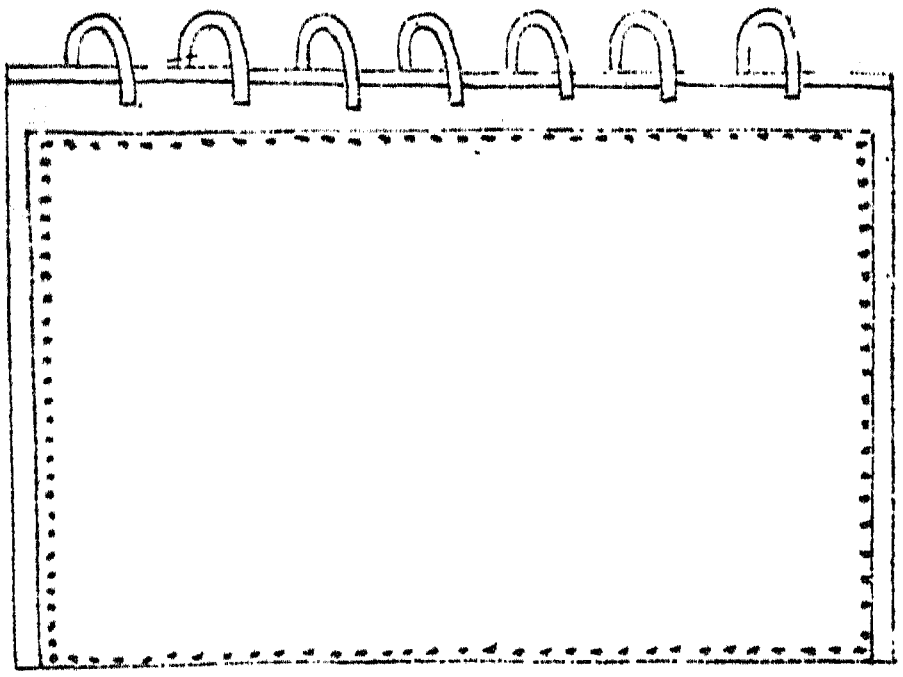
右風扇車二柱二枕高闊約地道能容上施轉軸軸四面施方扇凡地道中遇敵人用扇颺石灰簸火毬烟以害敵人

布幔



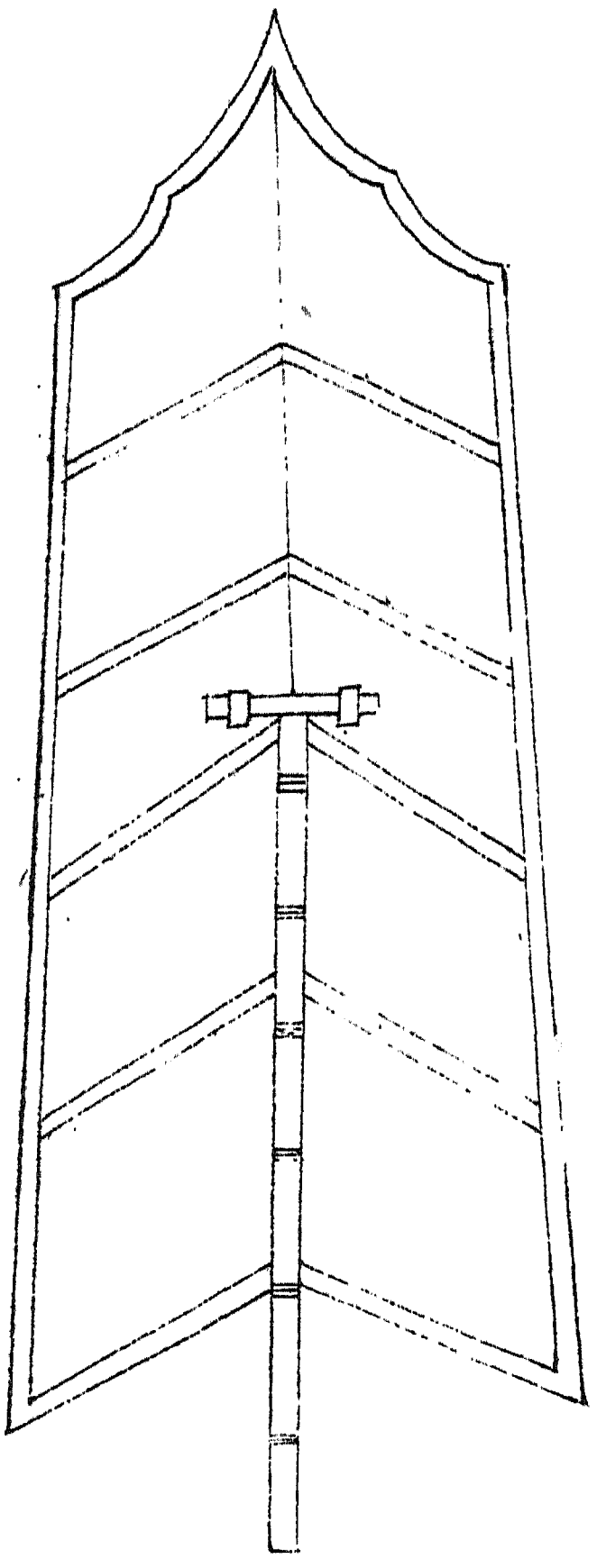
右布幔以複布為幔度夫石來處以弱竿張掛去城七八尺居女牆之外以折夫石勢一說結麤繩為網如布幔張掛亦可護女墻樓櫓

皮簠



右皮簾以水牛皮為之闊一丈長八尺橫綴皮耳七箇
凡城上有闕遮敵則張掛之

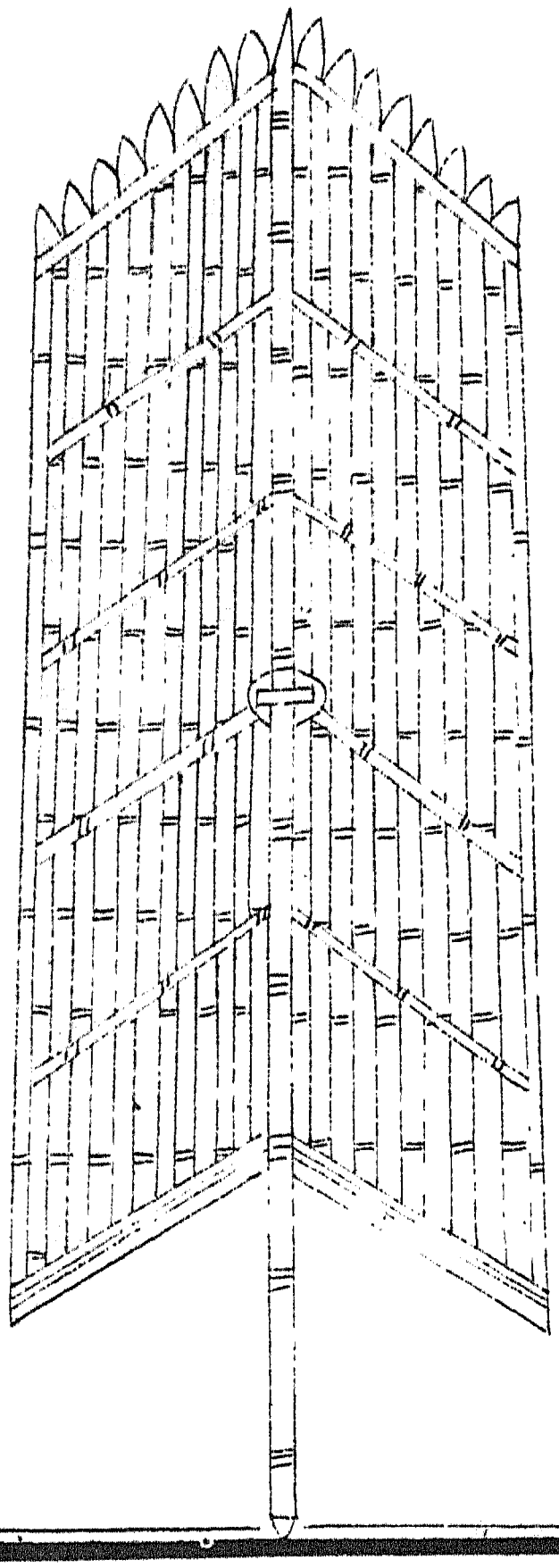
木立牌



右木立牌高五尺闊三尺背施横楅筆力反連轉關拐子

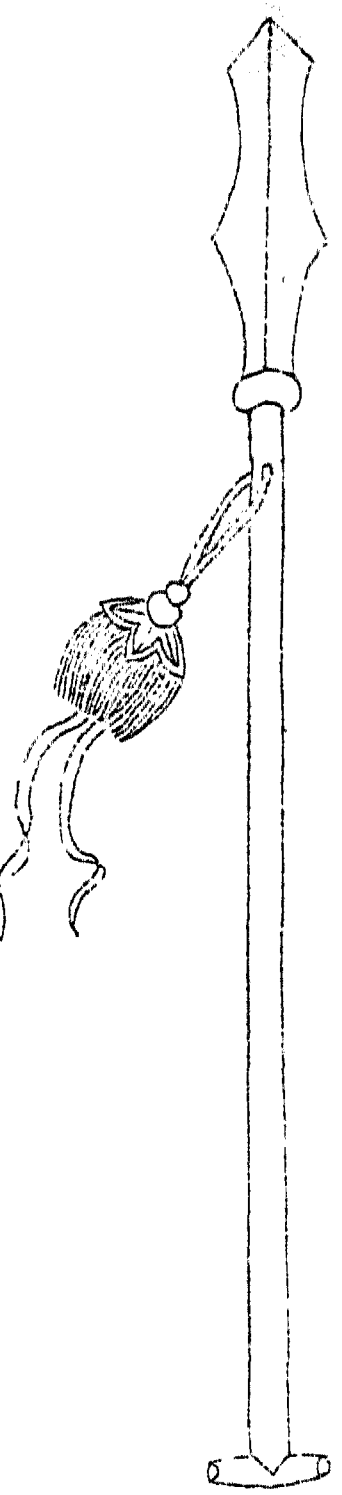
長三尺

竹立牌

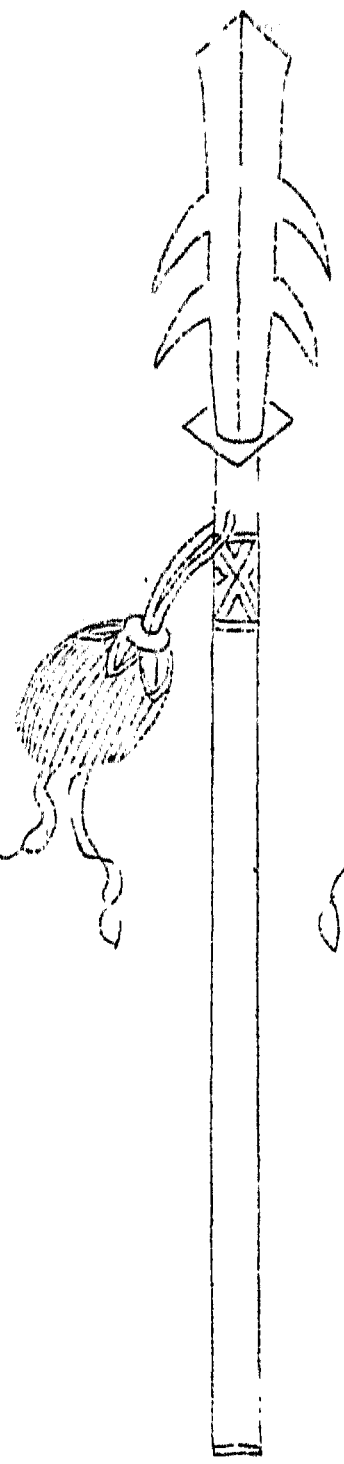


竹立牌取厚竹條闊五分長五尺者用生牛皮條編成
上銳下方餘如木牌之制一法用今生牛皮穿空以
厚竹編之尤堅皆楯之類也可以巡城及敵棚上以
防火砲火箭之類亦以蔽人射外

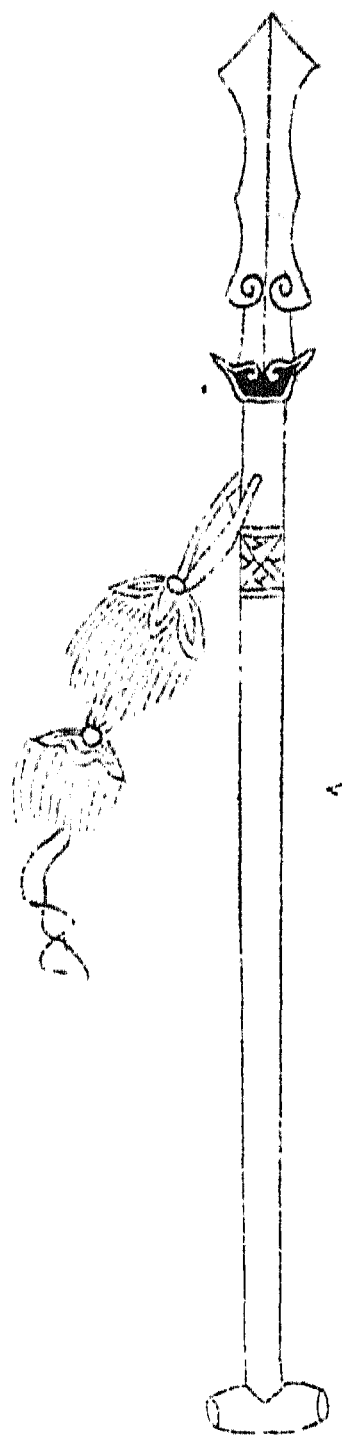
拐突鎗



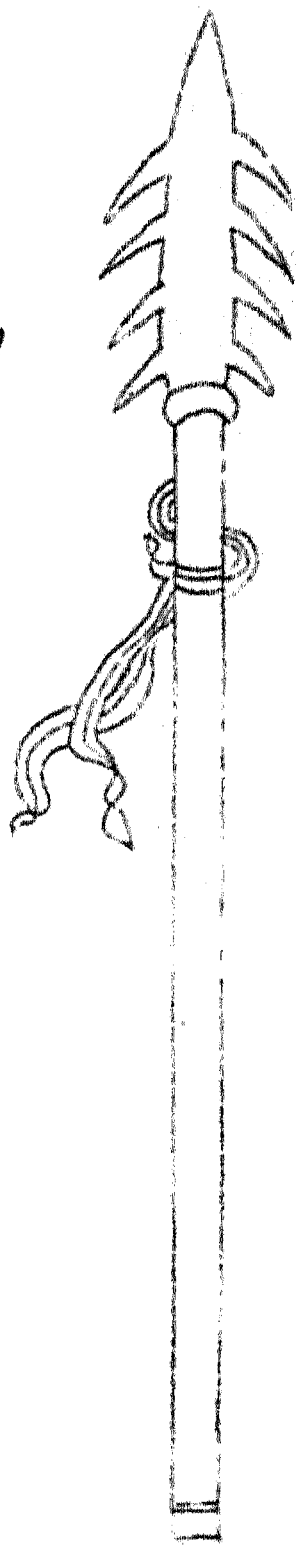
抓鎗



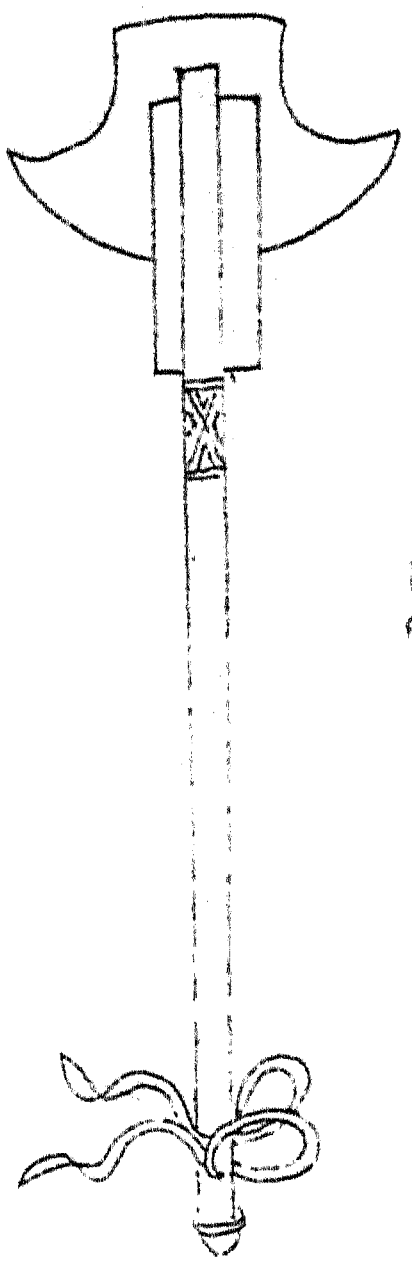
拐刃鎗



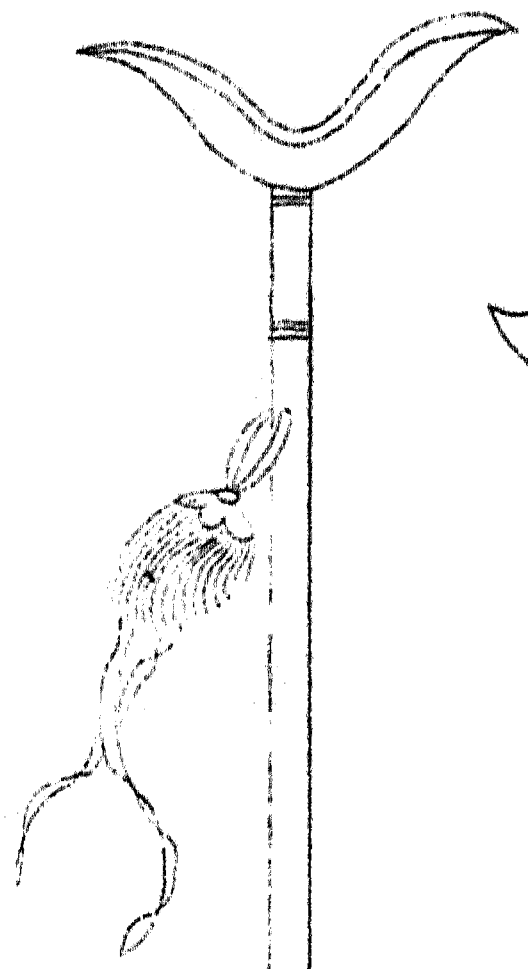
鉤竿



刺手斧



叉竿



右拐突鎗桿長二丈五尺上施四稜麥穗鐵刃連跨長二尺後有拐

抓鎗二丈四尺上施鐵刃長一尺下有四逆鬚連跨長二尺

拐刃鎗桿長二丈五尺刃連跨長二尺後有拐長六寸

鉤竿如鎗兩傍加田刃竿首二尺裹以鐵葉施鐵剌如

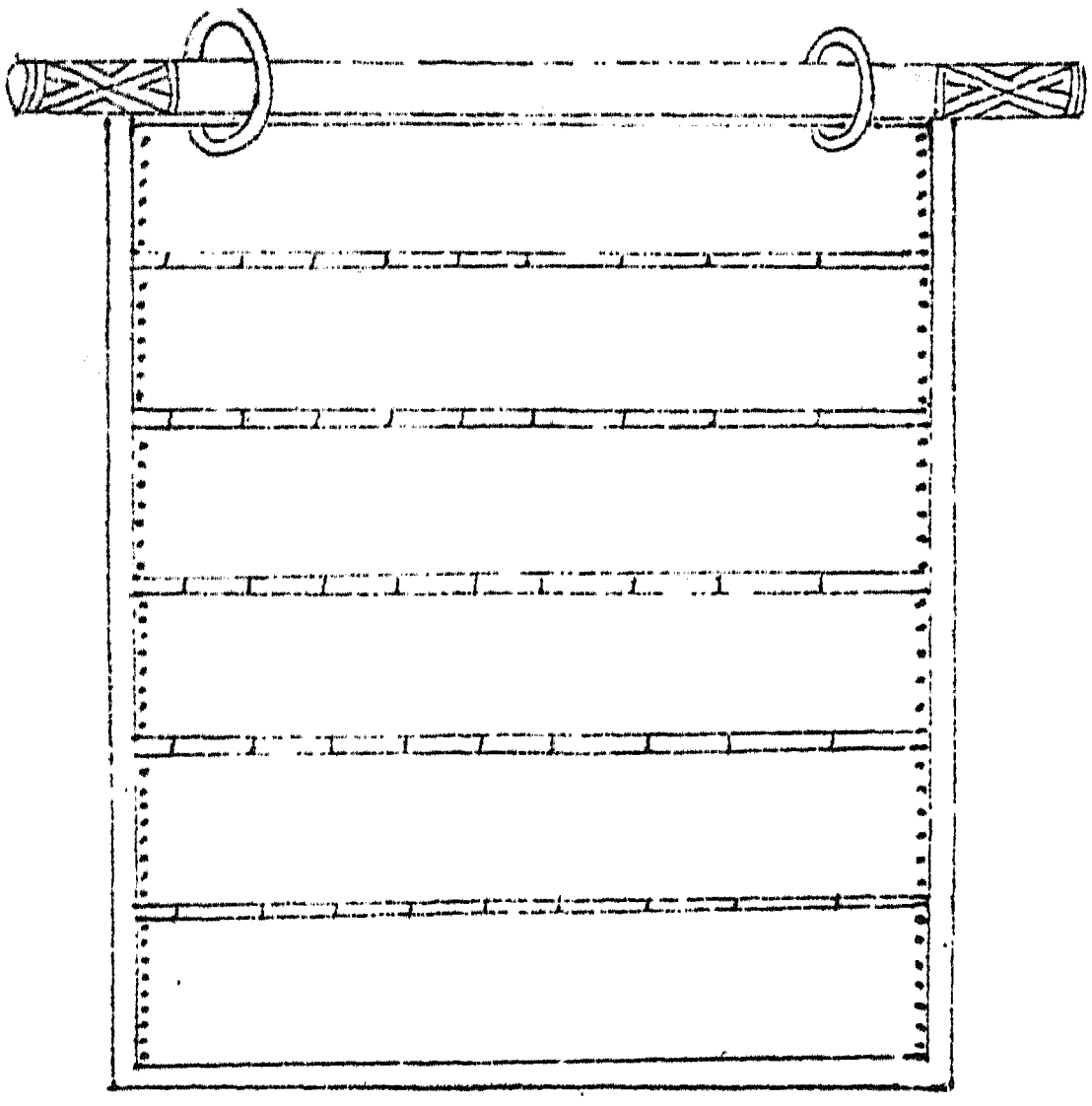
雞距

劉手斧直柄橫刃刃長四寸厚四寸五分闊七寸柄長

三尺五寸柄施四刃長四寸並用於敲樓戰棚蹈空版下鉤刺攻城人及斫攀城人手

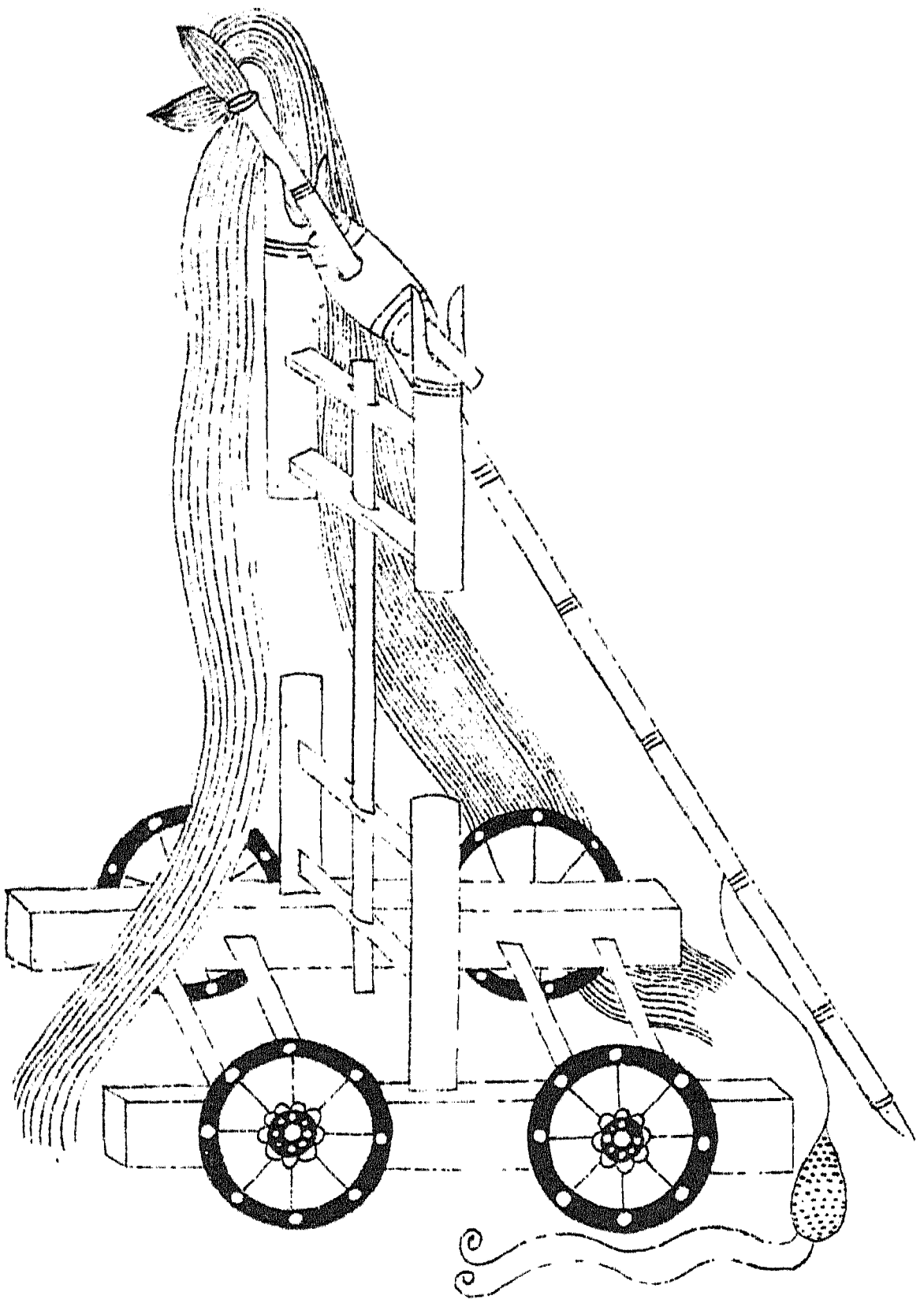
又竿長二丈兩歧用以叉飛梯及登城

土色氊簾



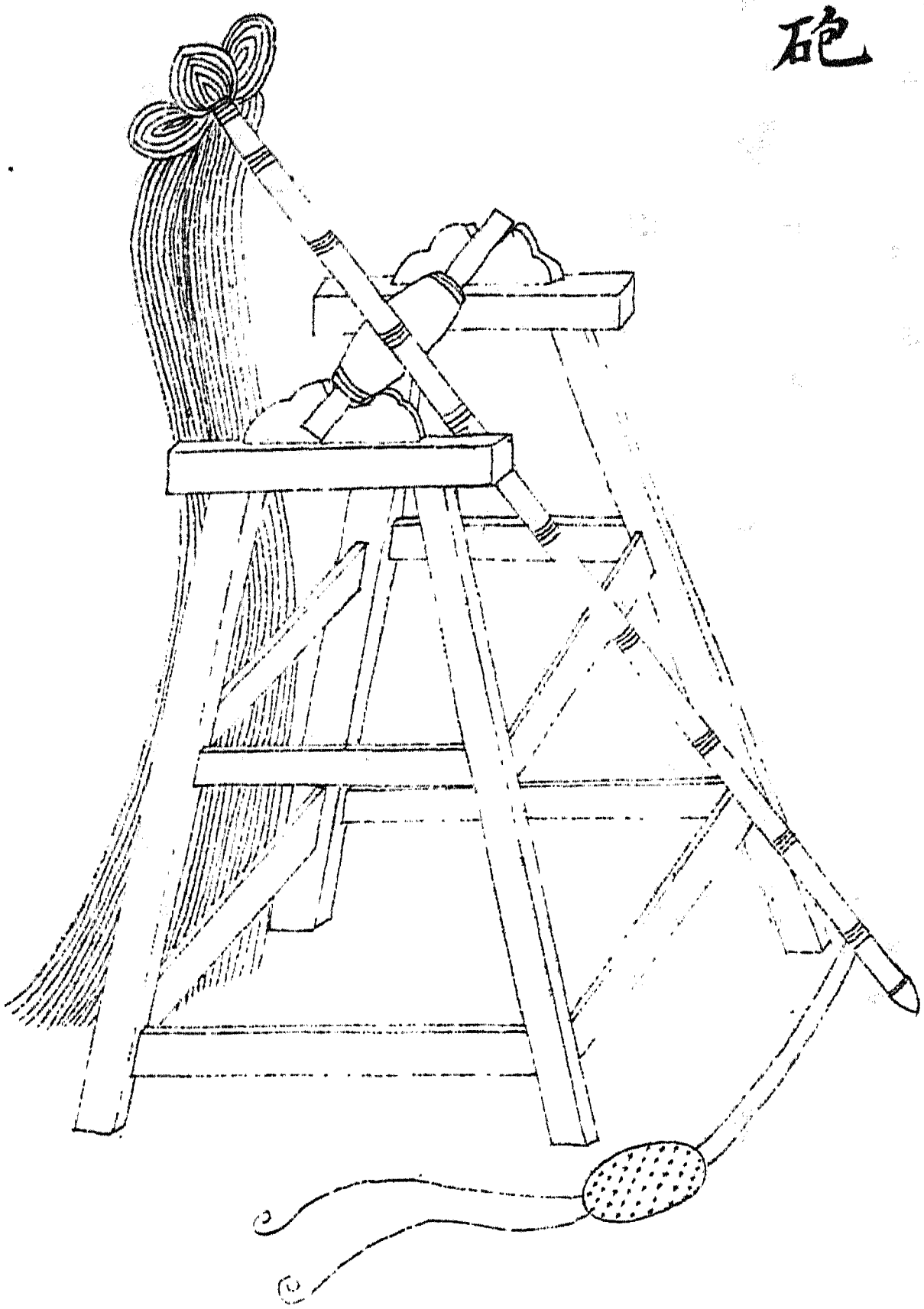
右瞳簾制為土色凡地道兩傍皆橫鑿洞穴可容十人執短兵藏穴中外垂簾為蔽與土色無別敵人攻奪地道則出兵捍之

砲車



右砲車大水為床下施四輪上建獨竿竿首施羅匡木
上置砲梢高下約城為準推徙往來以逐便利其施
放及用物一準常砲法

單梢砲

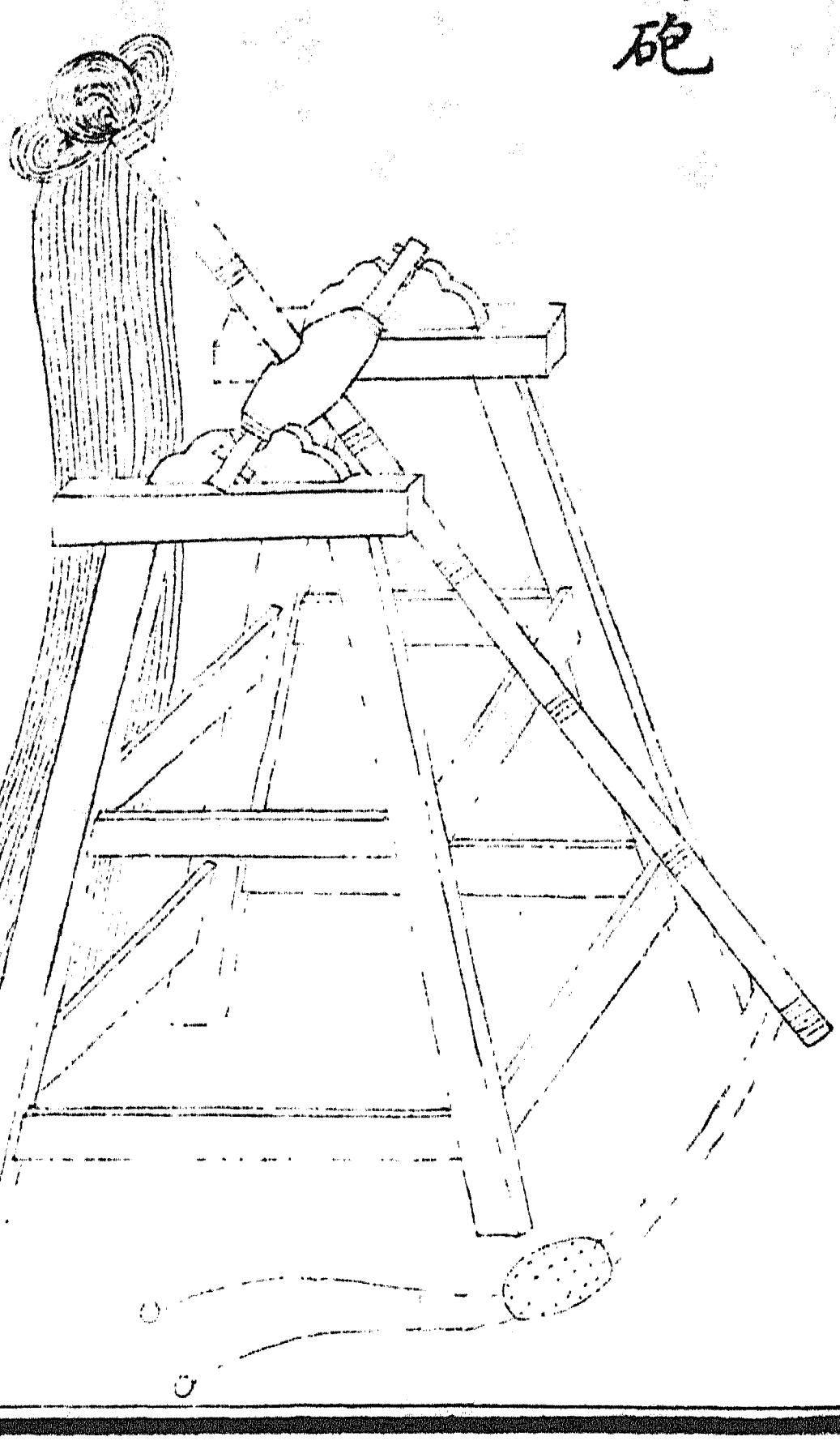


右單梢砲用前後脚柱四前長一丈八尺上出山口六寸裹以鉄葉後長一丈六尺五寸上扇桄長八尺五寸除仰斜留四尺五寸下扇桄長一丈三尺除仰斜留一尺上會桄一長八尺五寸除仰斜留四尺五寸下會桄一長一丈三尺除仰斜留九尺鹿耳四夾軸兩端長一尺一寸闊五寸厚三分軸一長七尺徑一尺罨頭木二長七尺徑一尺楔十六長一尺八寸闊四寸厚三分梢一長二丈五尺大徑四寸小徑二寸八分鴟頭一長二尺五寸闊七寸厚三分极竿二長二丈三尺大徑四寸小徑二寸鐵雙蝎尾一長一尺一寸重二斤鐵束二每箇重七兩圍七寸狼牙釘十八絃子二長二丈五尺十二子用麻一斤八兩皮窩一長八寸闊

六寸扎索六長五丈每條用麻二斤半
長四丈用麻四斤

凡一砲用四十人拽一人定放放五十步石重二斤

單梢砲



右單梢砲用脚柱四長一丈二寸徑一尺二寸仰斜三寸從威栗頭至上扇栿五尺七寸

上扇栿二長一丈除仰斜留六尺五寸

下扇栿二長一丈五尺除仰斜留一尺自上扇栿至此五尺九寸

上會栿二長留一丈除仰斜六尺五寸

下會栿二長一丈六尺除仰斜留一丈二尺

軸一長八尺除仰斜留五尺鑿眼一圓三寸徑一寸

鹿耳四夾軸兩端長一尺二寸闊五寸厚三寸

卷頭木二長八尺徑九寸

楔二十長一尺八寸闊五寸厚三寸

梢一長二丈六尺大徑四寸小徑二寸八分

鴈頭一長二尺五寸闊八寸厚五寸

鵝項一長五尺

鐵蝎尾二長二尺二寸每條重二斤半

鐵束四每箇重七兩圍七寸

狼牙釘十六紘子二長三丈五尺每條十二子用麻二斤

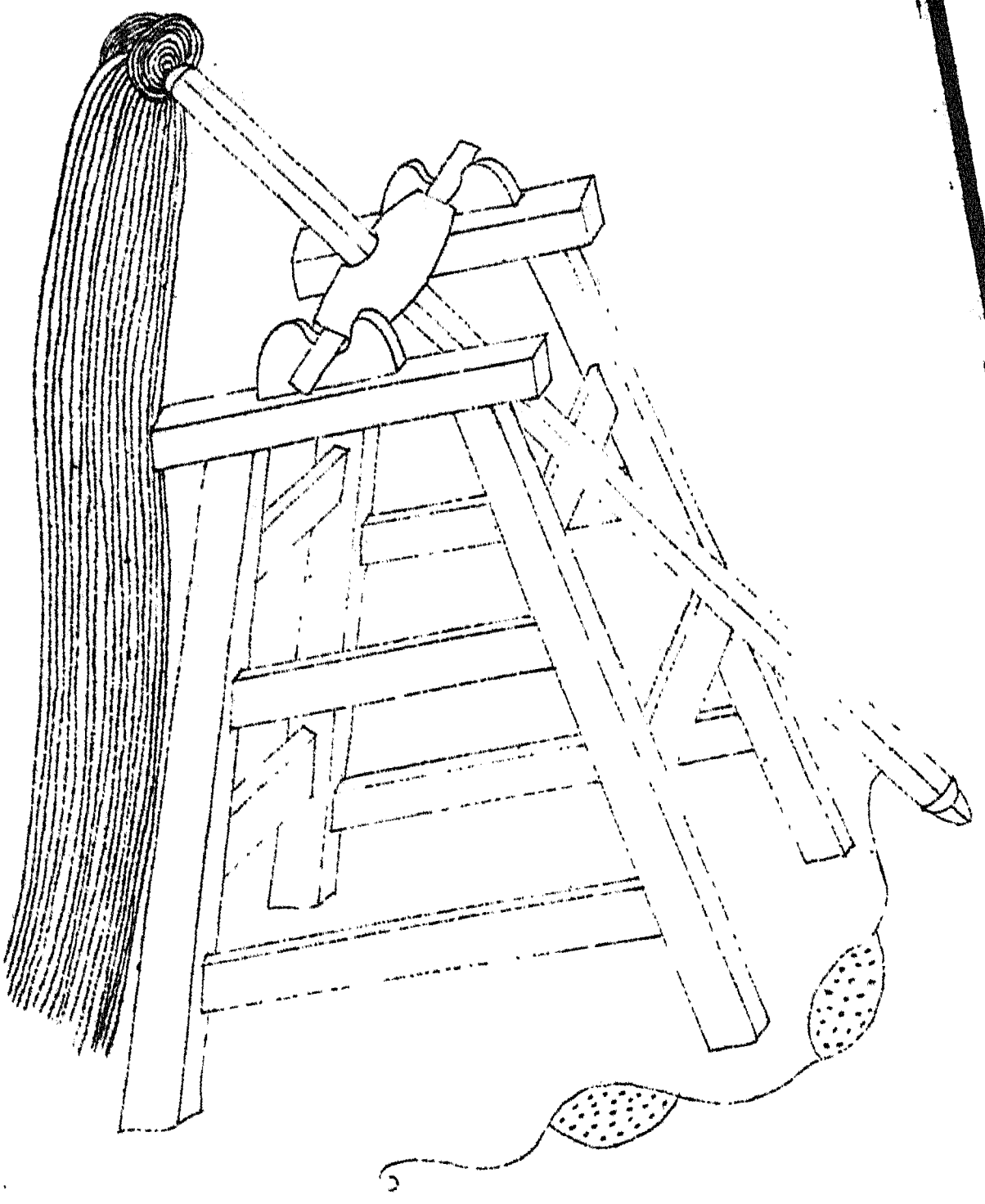
皮窩一長八寸闊六寸如鞋底樣

繫索二十五　長五丈每條用麻二斤半

拽索五十　長五丈每條用麻五斤

凡一砲百人拽一人定放八十步外石重二十五斤亦放火毬火鷄火槍撒星石放及六十步外二砲守則圍敵馬面及甕城内

雙梢砲



右雙梢砲用脚柱四長二丈徑一尺二寸仰斜三寸從鹹栗頭至上扇枕二尺七寸

上扇枕二長一丈除仰斜留六尺五寸

下扇枕二長二丈五尺除仰斜留一丈一尺自上扇枕至此一尺九寸

上會枕二長一丈除仰斜留六尺五寸

下會枕二長一丈六尺除仰斜留五尺鑿孔二圓四寸徑一寸

鹿耳四夾軸兩端長一丈二寸闊五寸厚三分

罨頭木二長八尺徑七寸

楔二十長一尺八寸闊五寸厚三分

梢二長二丈六尺徑四寸小徑八分

鴟頭木一長二尺五寸闊八寸厚三分

鵝項一長五尺五寸

杈竿一長二丈四尺徑六寸

杈竿一長二尺四寸徑六寸

鐵蝎尾二長一尺二寸每條重二斤八兩

鐵束四每箇重七兩闊七寸

狼牙釘八紘子一長二丈五尺十二子用麻三斤

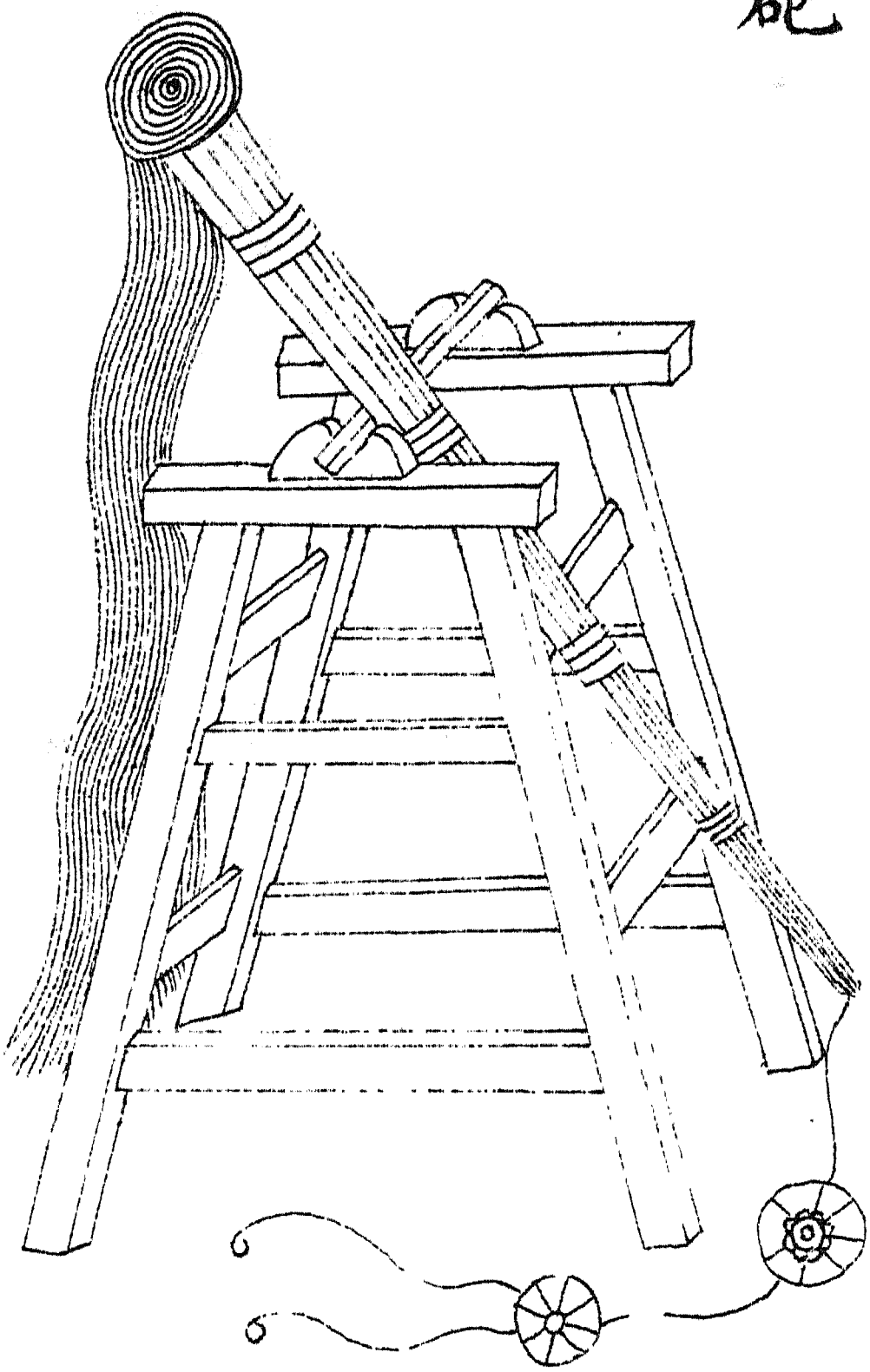
皮窩一長八寸闊四寸麻二斤八兩

扎索九長五丈每條用麻五斤

拽索四十五長五丈每條用麻五斤

凡一砲四十人拽一人安定放放五十步外石重二斤守則設於城内四面以擊城外寇

五梢砲



凡五梢砲用脚柱四長一丈二寸徑一尺二寸仰斜三寸從廠栗頭至上扇栿二尺七寸

上扇栿二長一丈二尺除仰斜留八尺

下扇栿二長一丈八尺除仰斜留一丈四尺自上扇栿至此一尺九寸

上會栿二長一丈三尺除仰斜留九尺

下會栿二長一丈九尺除仰斜留一丈五尺

軸一長九尺除仰斜留六尺五寸徑一尺二寸

鹿耳四夾軸長一尺二寸闊五寸厚三分

罨頭木二長九尺目方一尺用軸尺方闊四尺八寸

楔二十 長一尺八寸闊五寸厚三寸

梢三 長一丈五寸大徑四寸小徑二寸八分

鴟頭一 長四尺闊八寸厚四寸

鵝項一 長五尺七寸

杈竿二 長二丈五尺大徑四寸小徑二寸八分

鐵蝎尾二 長一尺五寸每條重三斤

鐵束四 每箇重八兩圍七寸

狼牙釘十六紵子二 長五寸十二子用麻三斤

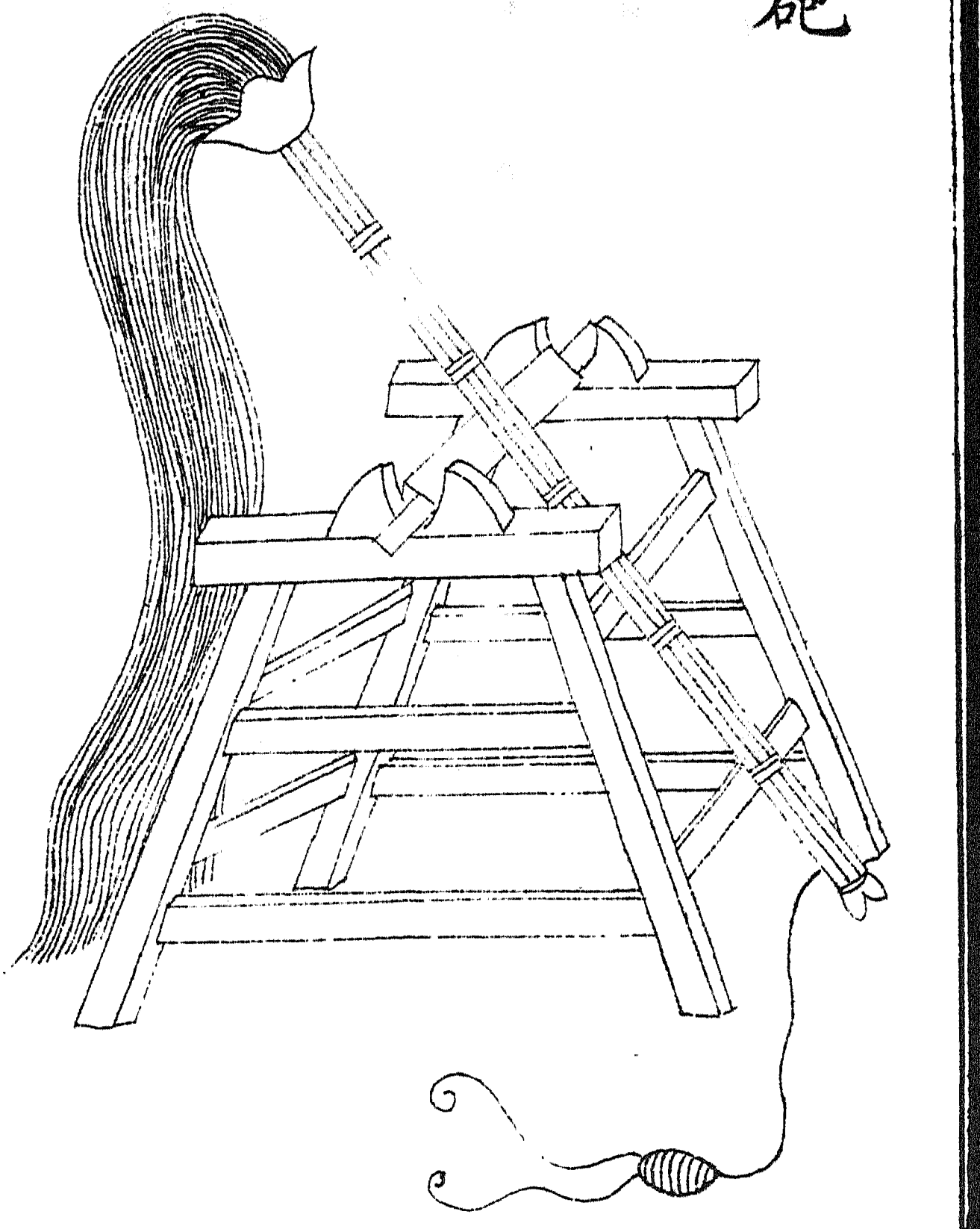
皮窩二長一尺濶八寸

繫索四十五長五丈每條用麻五斤半

拽索八十長五丈每條用麻五斤

凡一砲用一百五十人拽二人定放放五十步外石重七八十斤二砲則具設于大城門左右擊攻城人頭車

七梢砲



右七梢砲用脚柱四長二丈一尺徑一尺二寸仰斜三寸從戲栗頭至上扇栿三尺七寸

上扇栿二長一丈二尺除仰斜留八尺

下扇栿二長一丈八尺除仰斜留一丈四尺自上扇栿至此一尺九寸

上會栿二長一丈三尺除仰斜留九尺

下會栿二長一丈九尺除仰斜留一丈五尺

軸一長九尺除仰斜留六尺五寸徑一尺二寸

鹿耳四夾軸兩端長一丈二寸闊五寸厚三分

罨頭木二長九尺五寸目方一尺用轉尺取方四尺八寸

楔二十長一尺八寸闊五寸厚三寸

梢四長二丈八尺大徑四寸小徑二寸八分

鴟頭一長四尺闊八寸厚四寸

鵝項一長五尺七寸

杈竿三長二丈五尺大徑四寸小徑七寸八分

鐵蝎尾二長一尺五寸每條重三斤

鐵束四每箇重八兩圍七寸

狼牙釘十六紘子二各長二丈八尺十二子用麻三斤

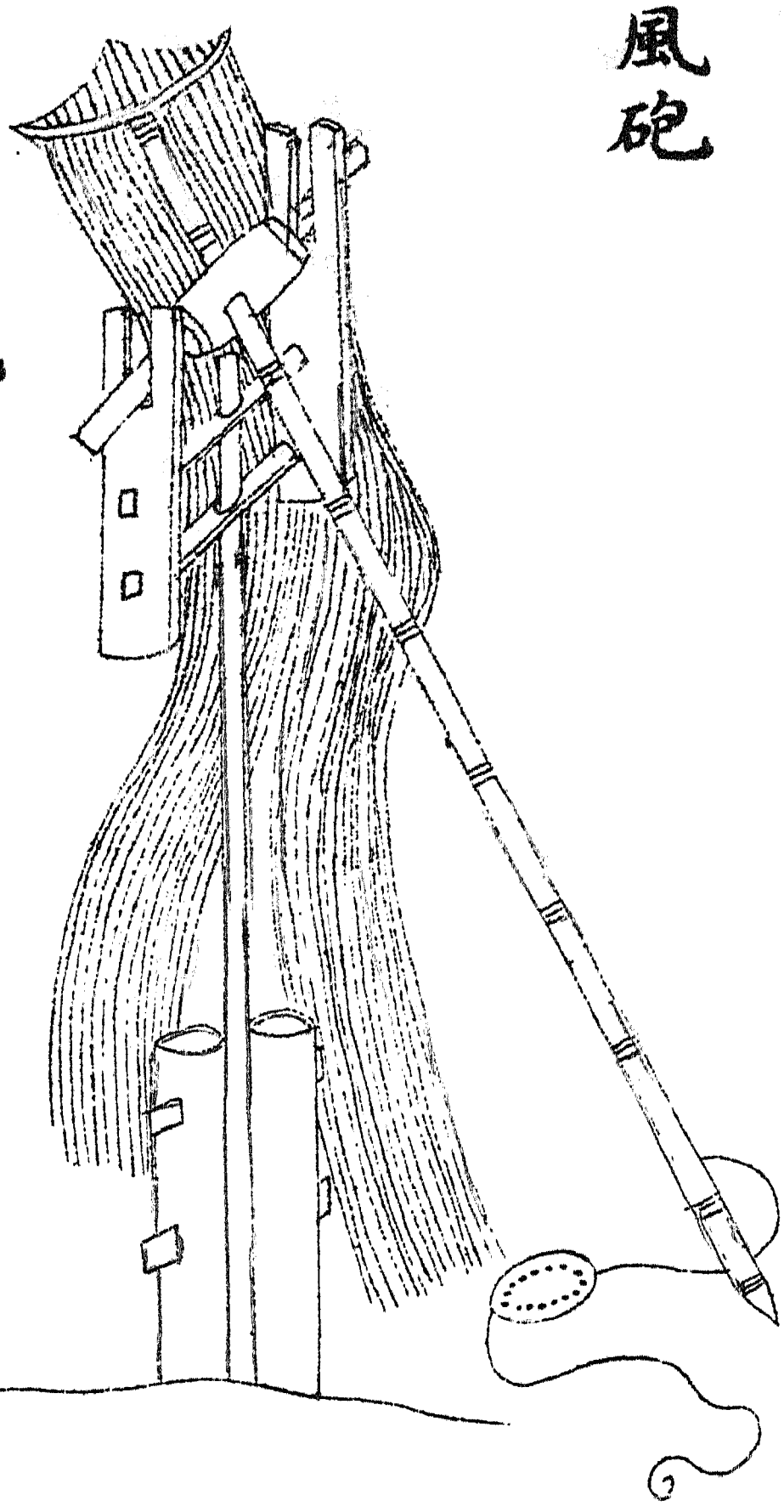
皮窩一長一尺二寸闊一尺

繫索五十長五十尺每條用麻二斤半

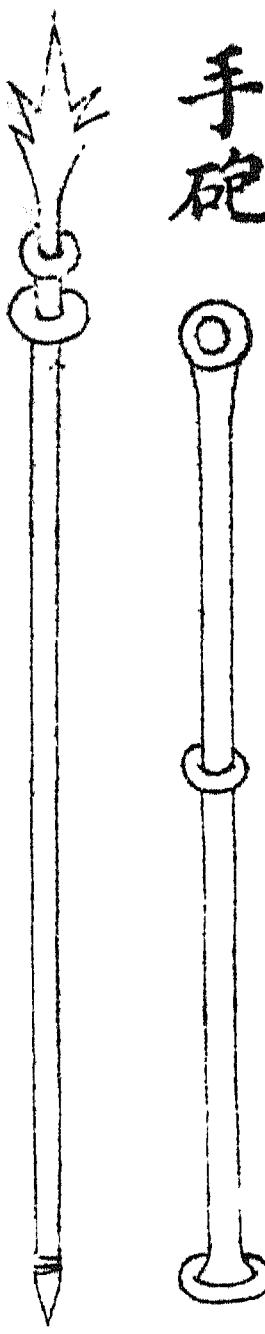
拽索一百二十五長五丈每條用麻五斤

凡一砲用二百五十人拽二人定放放五十步外石重九十斤

旋風砲



手砲



右旋風砲用衝天柱一長一丈七尺徑九寸下埋五尺
夾木二長八尺五寸闊八寸厚五寸
軸一長四尺五寸徑八寸兩頭用鐵葉裹包
鐵仰月二每箇重十兩
梢一長一丈八尺大徑四分小徑二寸八分
鴟頭一長一尺五寸闊七寸厚三寸
鐵蝎尾一長一尺二寸重一斤半
鐵束二每箇重七兩圍七寸

狼牙釘八紘子一長二丈三尺十二子用麻一斤八兩

皮窩一長八寸闊四寸如鞋底樣皮用八兩

拽索四十長四丈每條用麻四斤

扎索六長四丈每條用麻一斤半

凡一砲用五十人拽一人定放放五十步外石重三斤其柱須埋定即可發石守則施於城上戰棚左右手砲敵近則用之

砲竿一長八尺

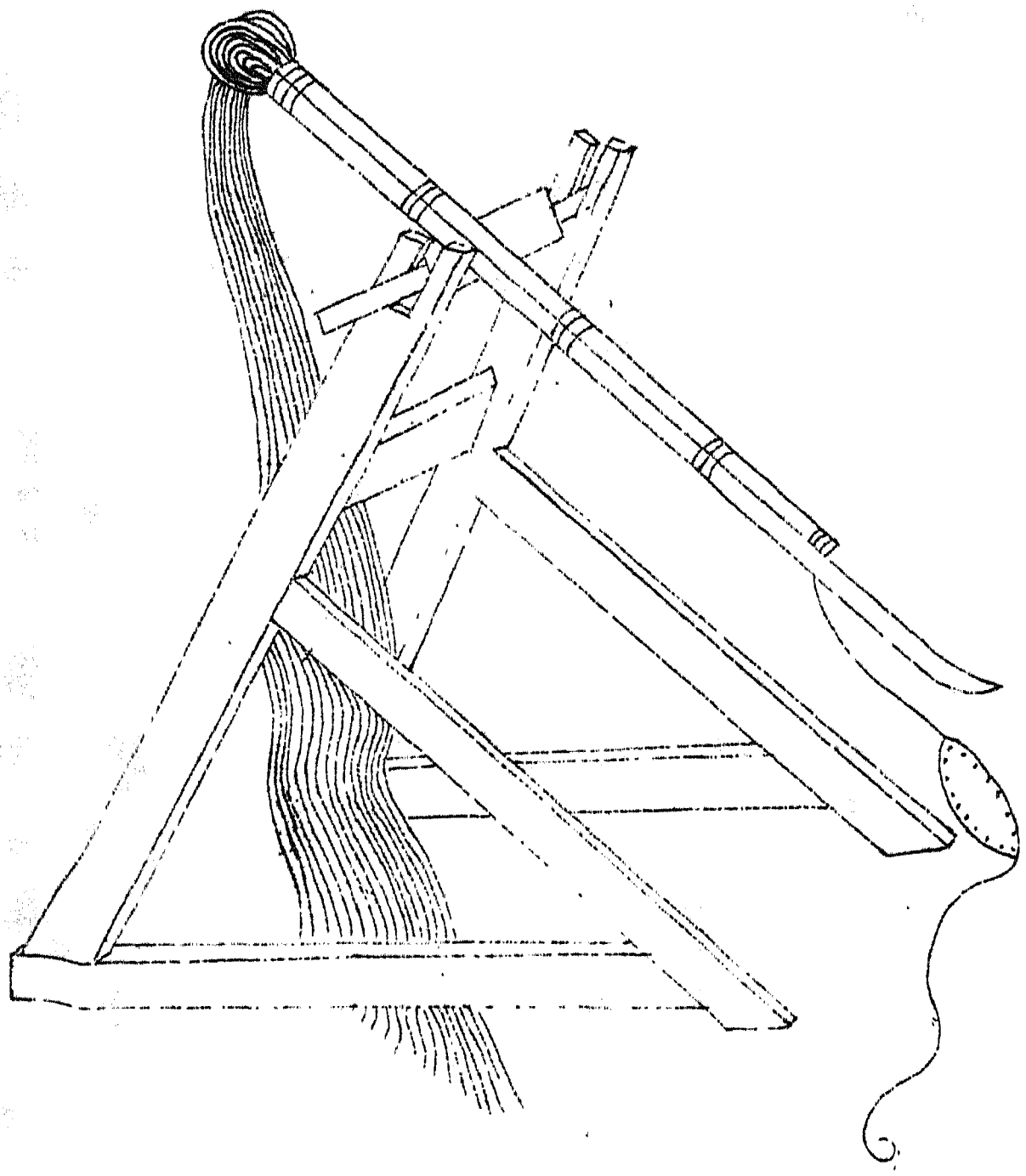
蝎尾一長四寸

鐵環一

皮窩一方二寸半繫于竿上

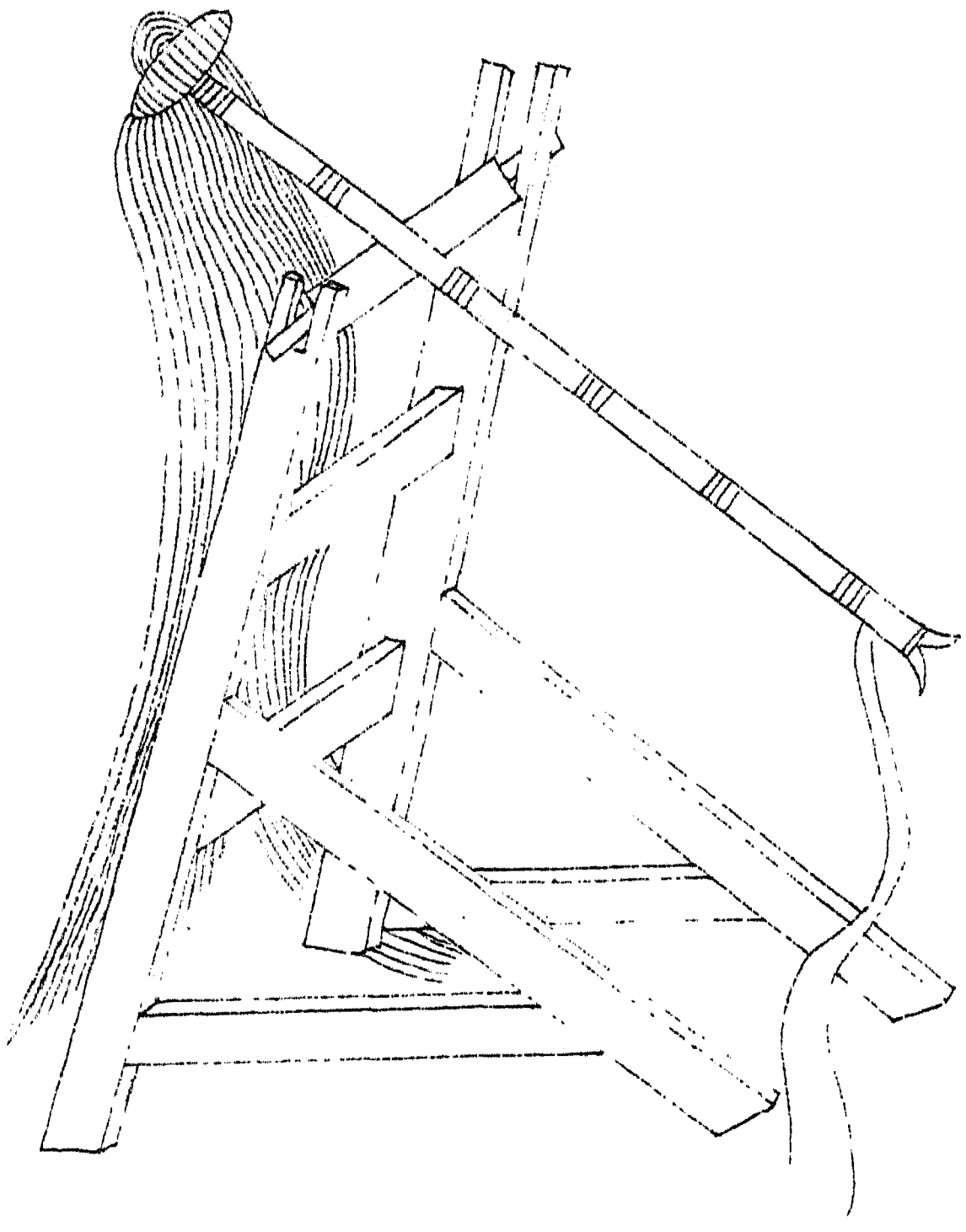
用二人放石重半斤

虎蹲砲

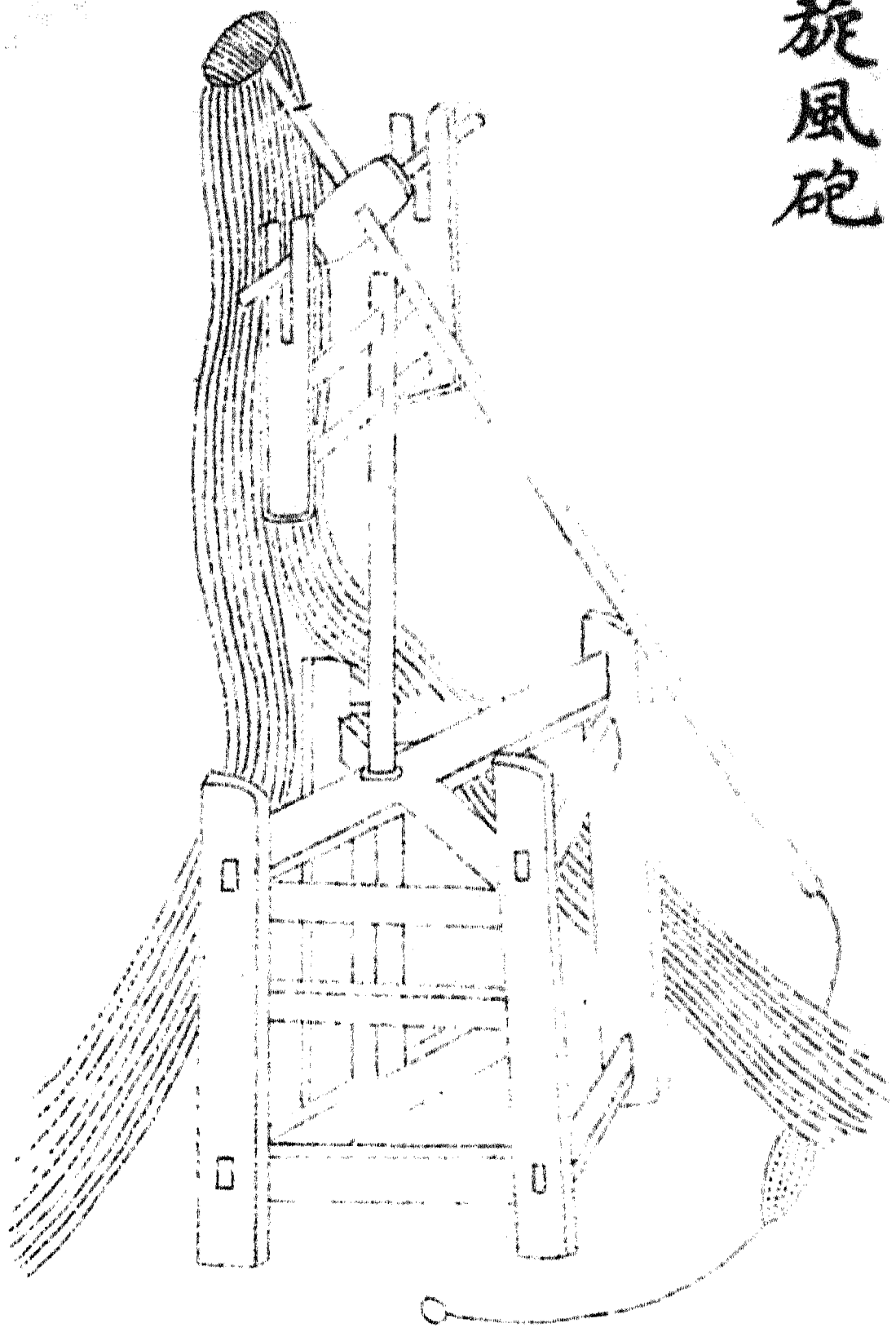


右虎蹲砲用前後脚柱四前長一丈八尺上出山口六寸上會枕二長八尺五寸裏以鐵葉後長一丈六尺五寸下會枕二長一丈三尺除仰斜留四尺五寸除仰斜留九尺軸一長七尺徑一尺罨頭木三長七尺徑一尺楔十六長一尺八寸闊四寸厚三寸大徑四寸梢一長二尺五寸小徑二寸八分鴟頭木一長二尺五寸闊七寸厚三寸大徑四寸極竿一長二尺五寸小徑二寸八分鐵雙蝎尾一長二尺二寸重二斤鐵束二每箇重七兩圍七寸狼牙釘十八紘子二長二尺五寸十二子用麻皮一斤八兩皮窩八長八寸繫索六長五十尺每條用麻四斤凡一砲七十人放五十步外石重十二斤八兩拽索四十長四丈每條用麻四斤凡一砲七十人放五十步外石重十二斤

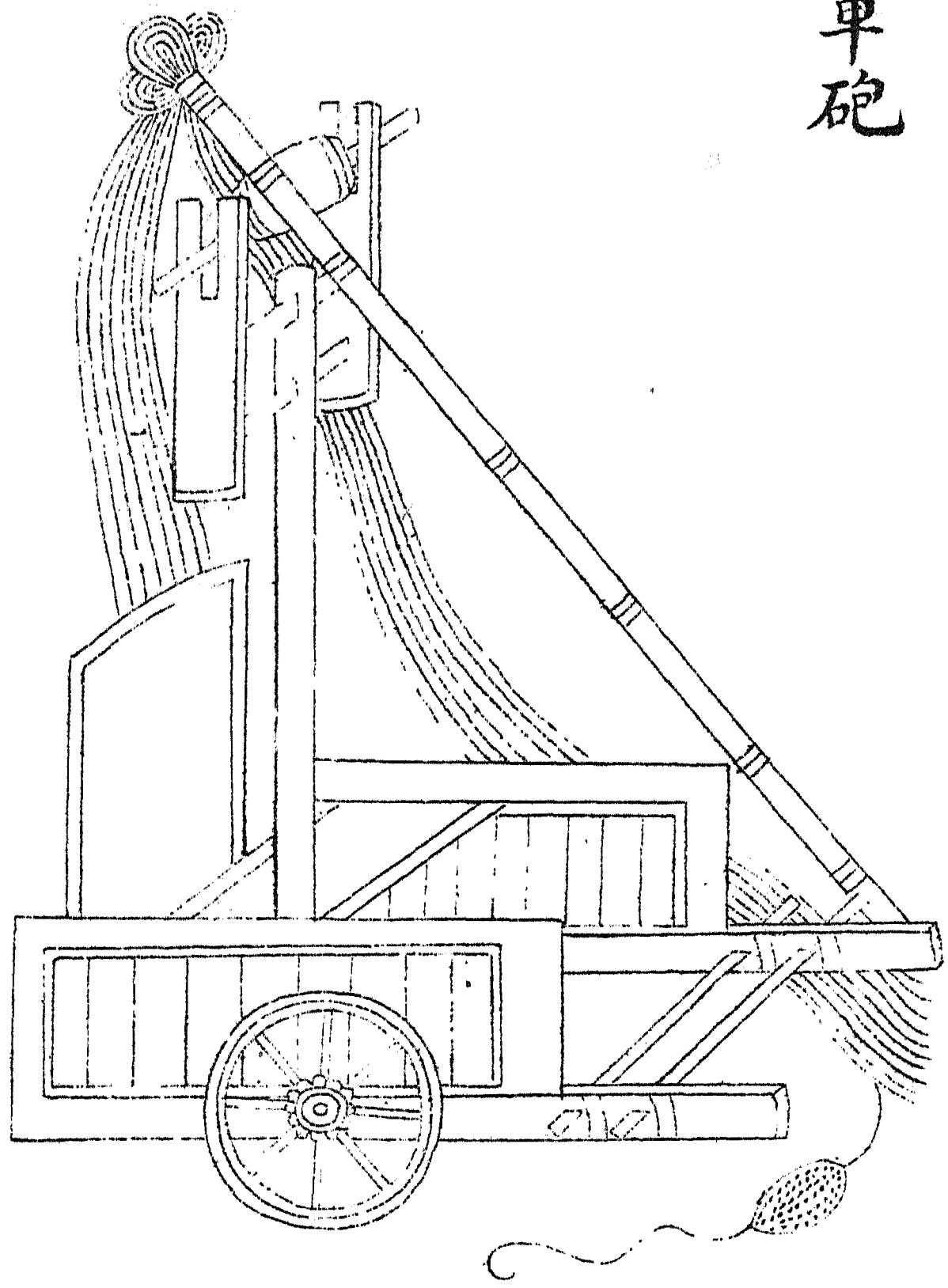
拄腹砲



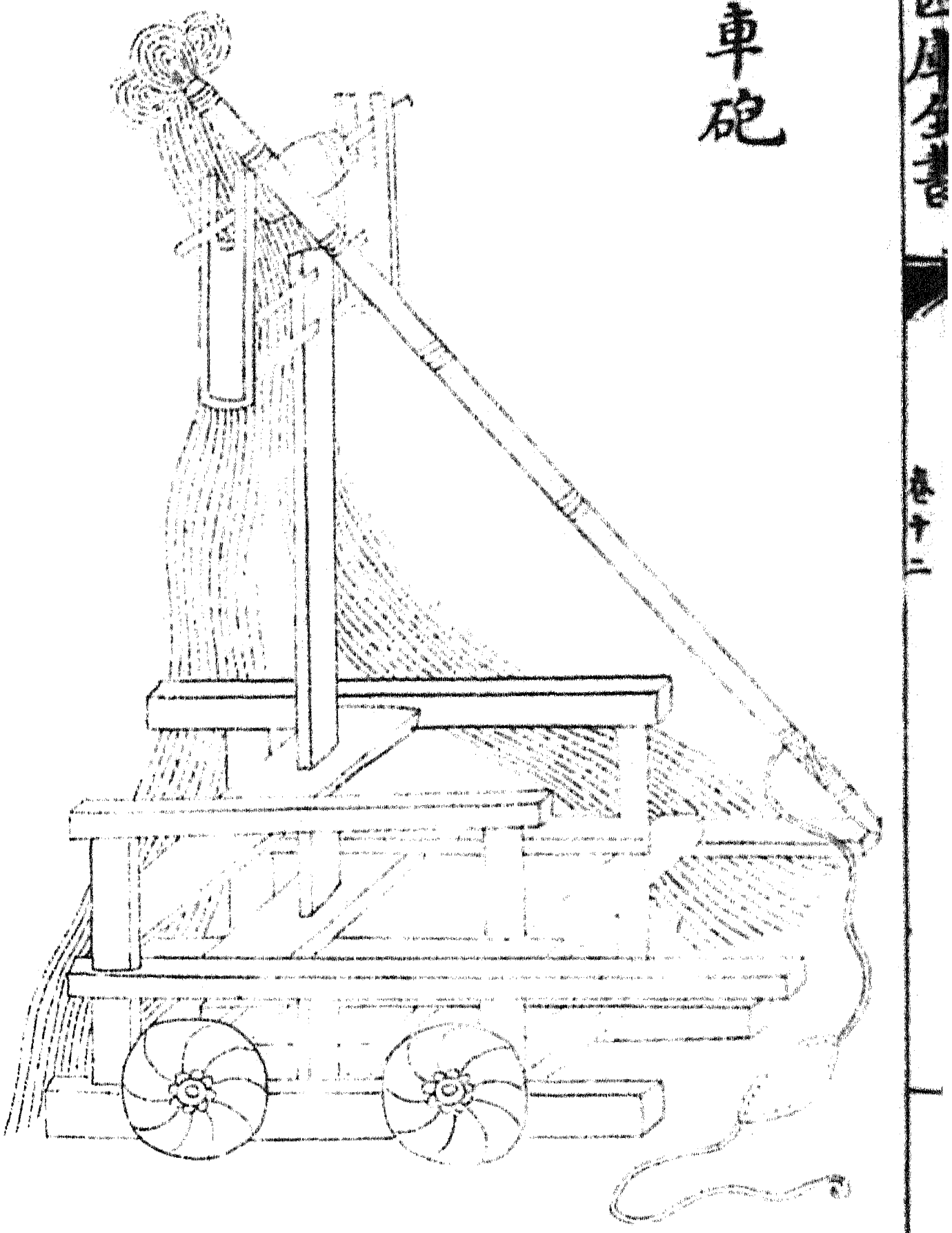
獨腳旋風砲



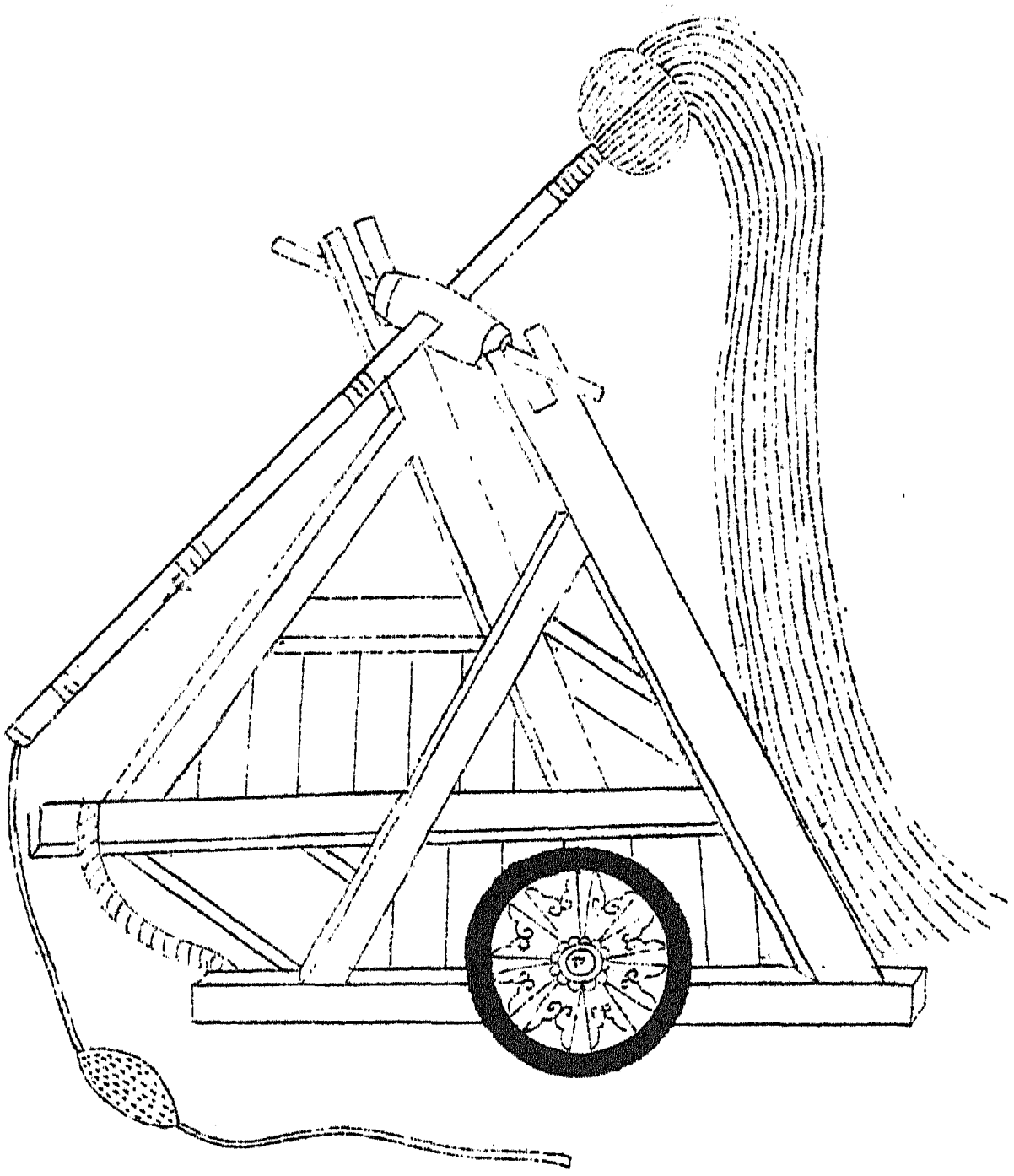
旋風車砲



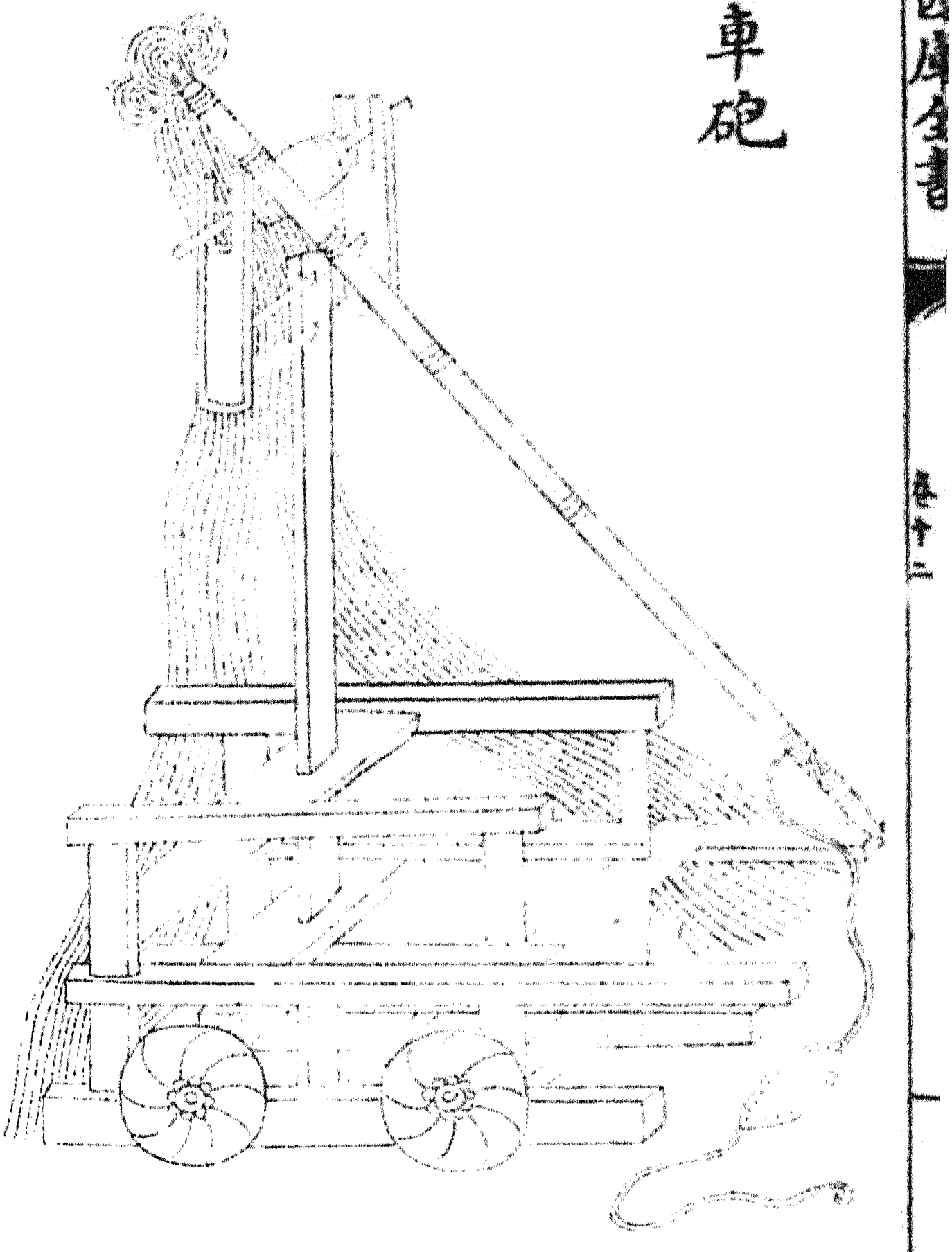
卧車砲



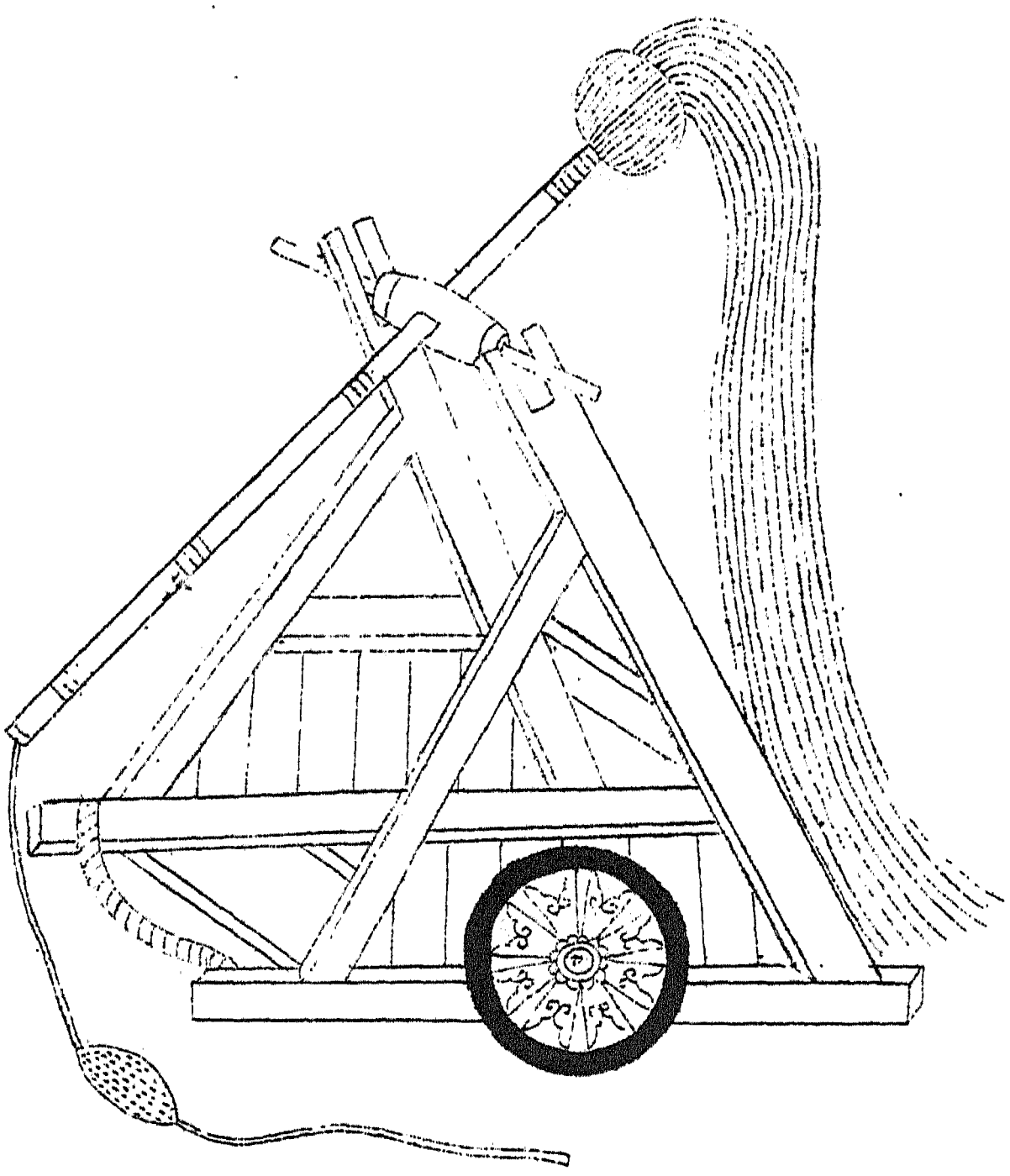
砲行車



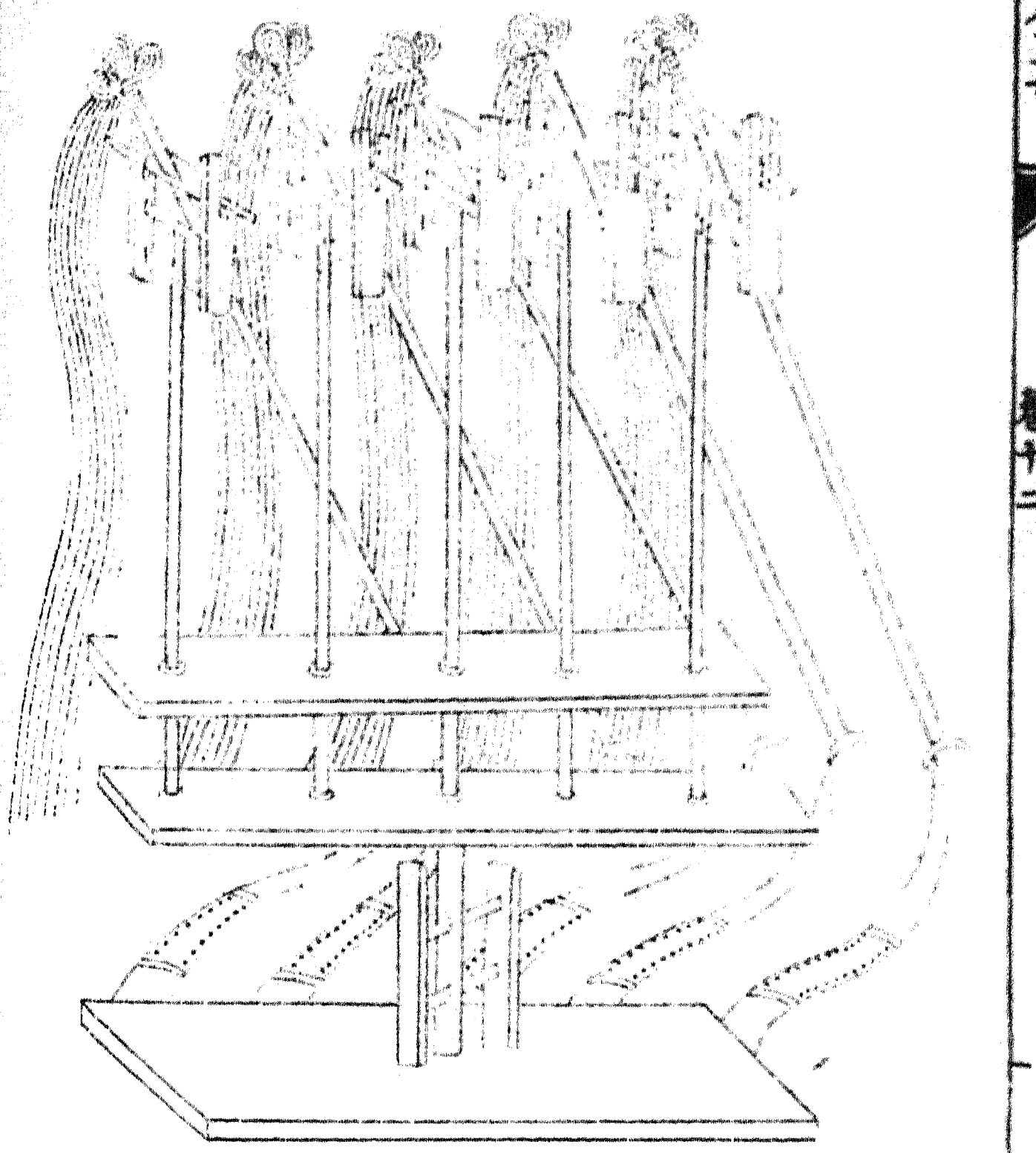
卧車砲



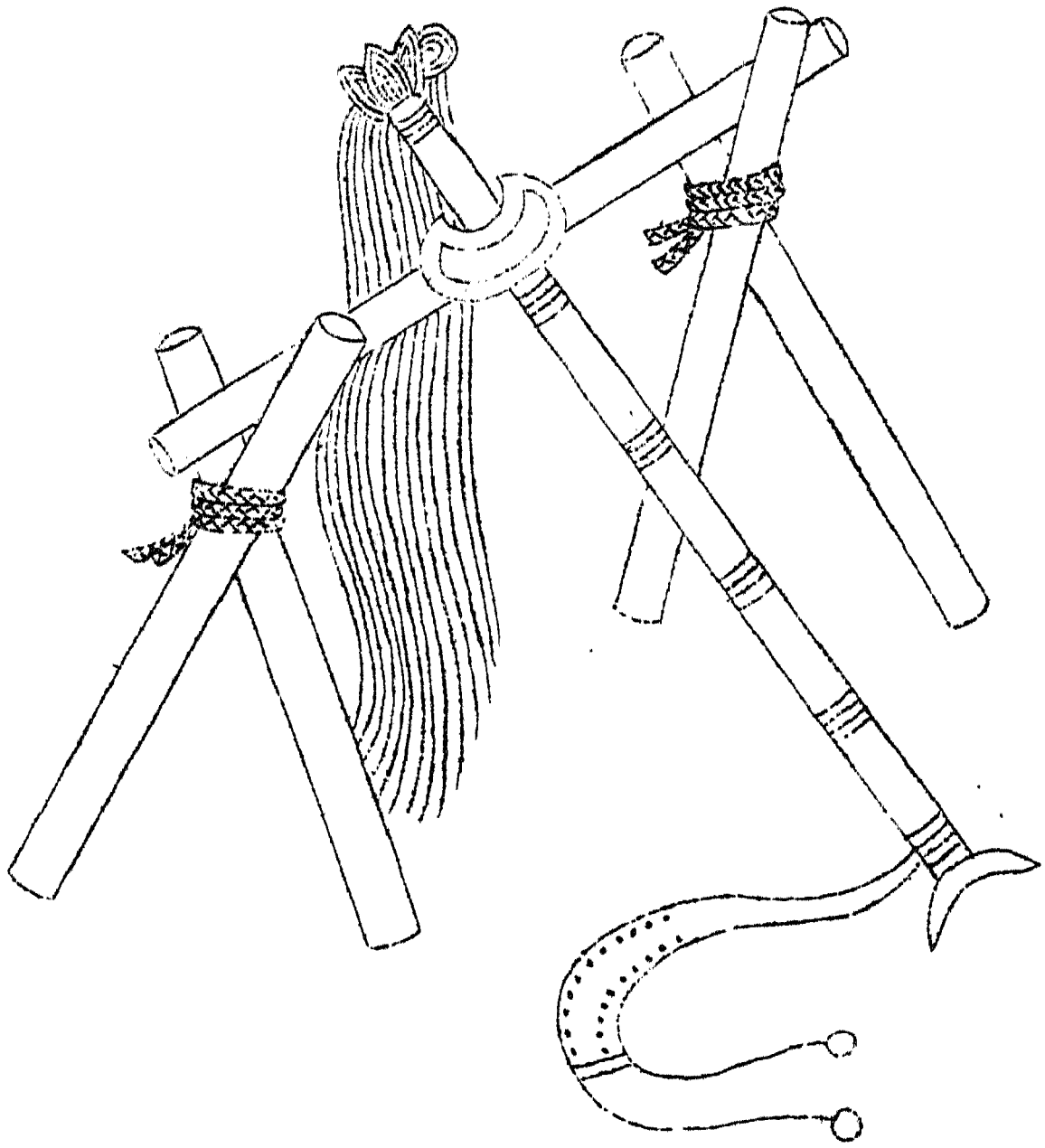
砲行車



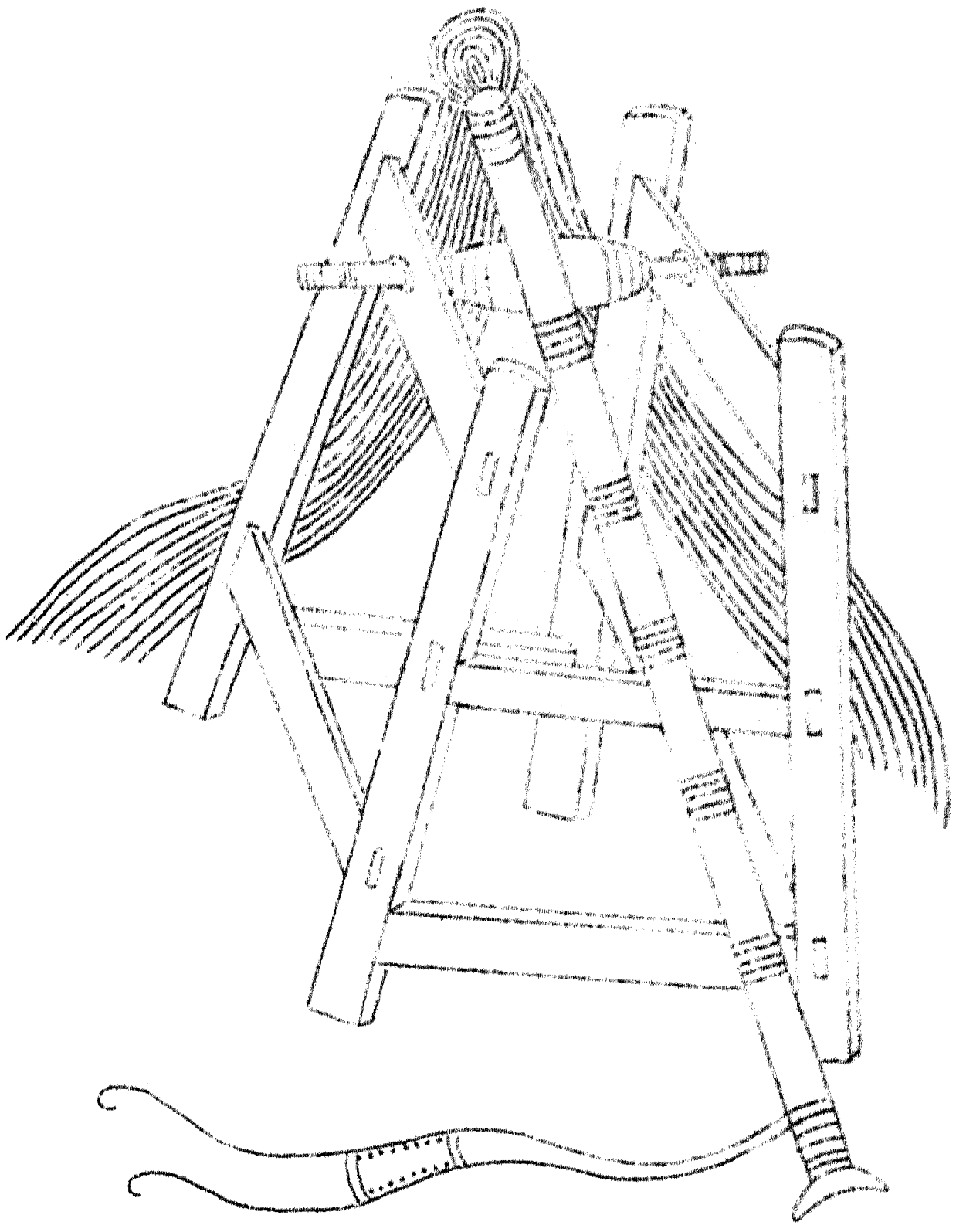
旋風五砲



砲合



砲火



凡砲中之利器也攻守師行皆用之守宜重行宜輕故旋風單梢虎蹲師行即用之守則皆可設也又陣中可以打其隊兵中其行伍則不整矣若熕劄糧積聚及城門敵棚頭車之類則上施火毬火鷄火槍以放之推車梢不可放以其力小故也其火毬等重及十二斤

隨砲動用

長木十二根長一丈徑三寸簽頭木一十二條

木杠四條　大斧三具　界索滑椓四十條

拐頭柱一十八條　皮簾八片　皮索一十條

散子木二百五十條　救火大桶二

鐵鈎十八箇　大木檻二箇　界扎索一十條

水灑二箇　拒馬二　麻搭四具　小水桶二隻

唧筒四箇　土布袋一十五條　界椽索一十條

鍬三具　氊一領　钁三具　火索一十條

右隨砲預備用以蓋覆及防火箭

火藥法

晉州硫黃十四兩　窩黃七兩　焰硝二斤半
麻茹一兩　乾漆一兩　矾黃一兩　定粉一兩
竹茹一兩　黃丹一兩　黃蠟半兩　清油一分
桐油半兩　松脂一十四兩　濃油一分
右以晉州硫黃窩黃焰硝同搥羅矾黃定粉黃丹同
研乾漆搥為末竹茹麻茹即微炒為碎末黃蠟松脂
清油桐油濃油同熬成膏入前藥末旋旋和勻以紙
五重裹衣以麻縛定更別鎔松脂傅之以砲放復有

放毒藥煙毬法具火攻門

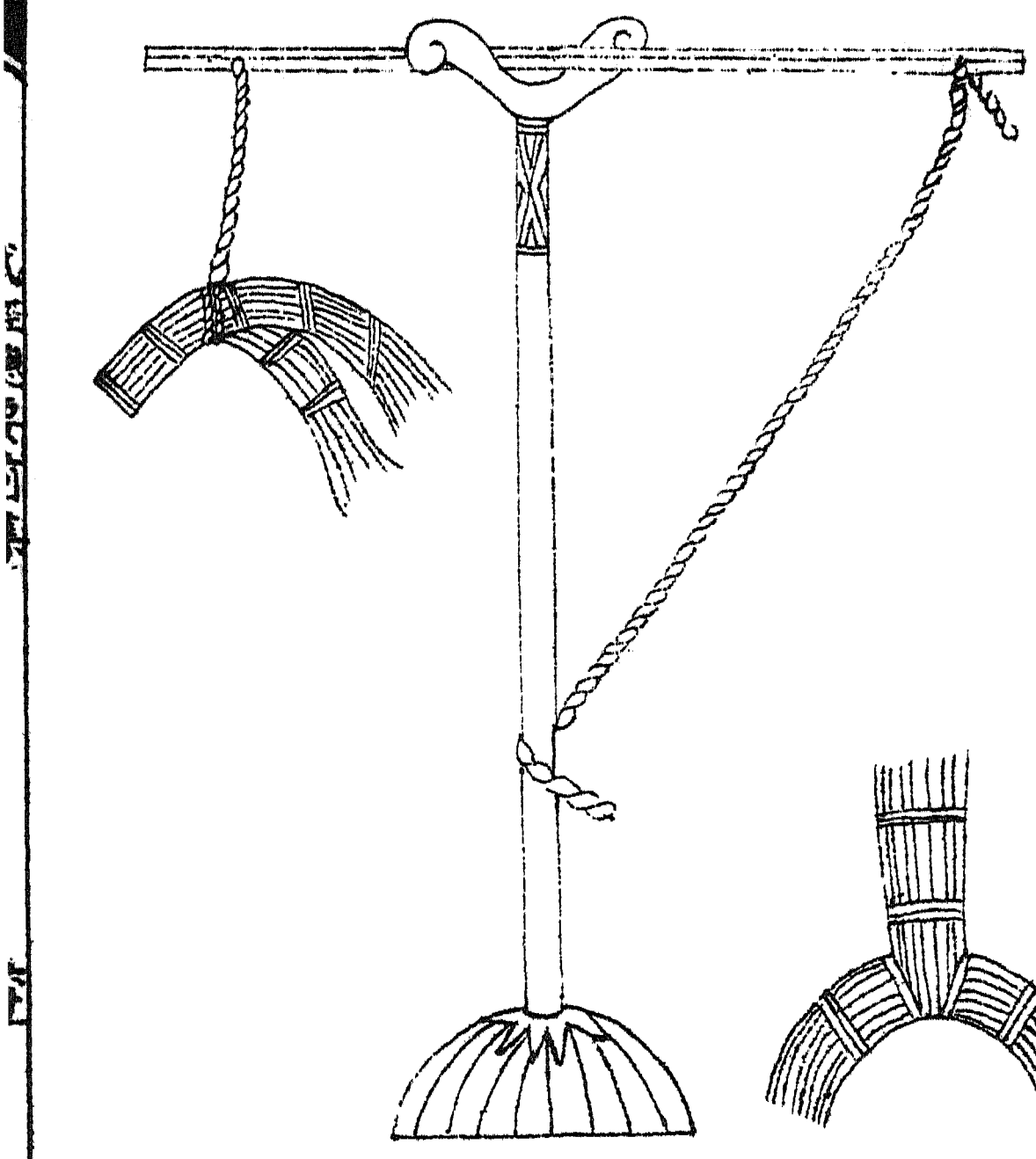
糞碗罐法

右先以人清塘槽内盛煉擇靜晒乾打碎用篩羅細盛在甕内每用人清一秤用狼毒半斤草烏頭半斤巴豆半斤皂角半斤硇砂半斤黃半斤班猫四兩石灰一斤荏油半斤入鏤内煎沸入薄瓦罐容一斤半以草塞口碗内放以擊攻城人可以透鐵甲中則成瘡潰爛放毒者仍以烏梅甘草置口中以辟其毒

金火罐法

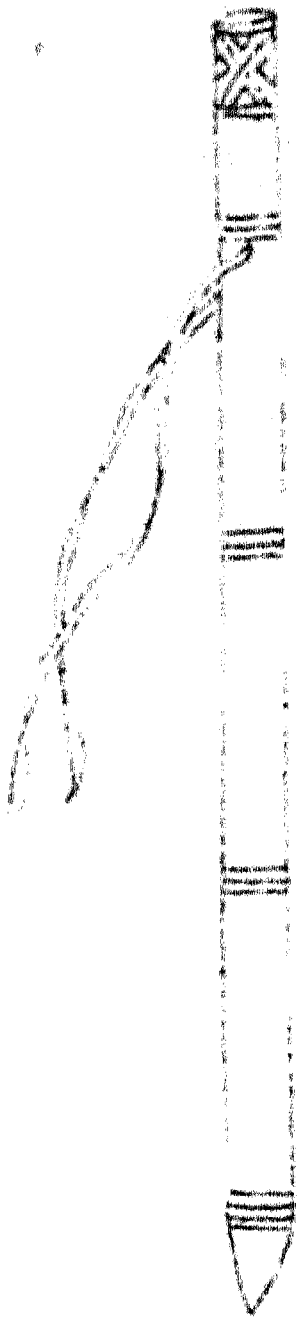
右其制圓九寸高四寸形圓口徑八分先用麻皮泥漿次使麥麵泥次又用猪鬃泥逐重塗傳煨煖後盛金火汁以麥麵土泥塞口用濕韉五指裹至肘者入炮內放其盛器則有生鐵篩盆用鑄成以盛金汁仍有兩耳手把把注則有生鐵杓熟鐵杓並把注金汁若敵來攻城有團隊者以金砲打之人馬中則解散放宜急勿使凝給凡砲拽二聲放此可一聲放之

飛炬

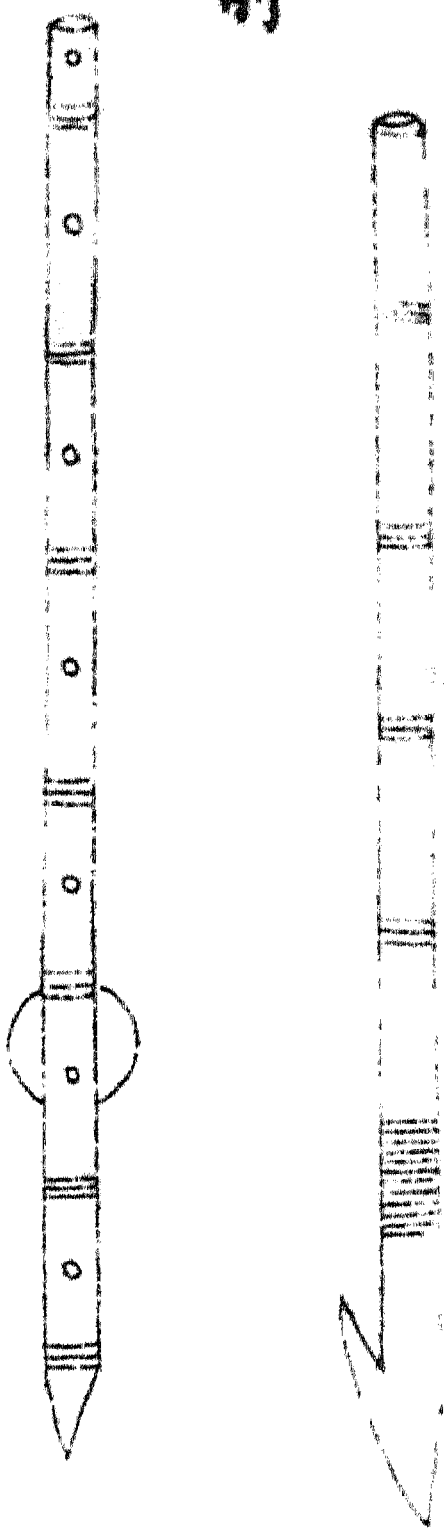


燕尾炬

鞭箭



火藥鞭箭

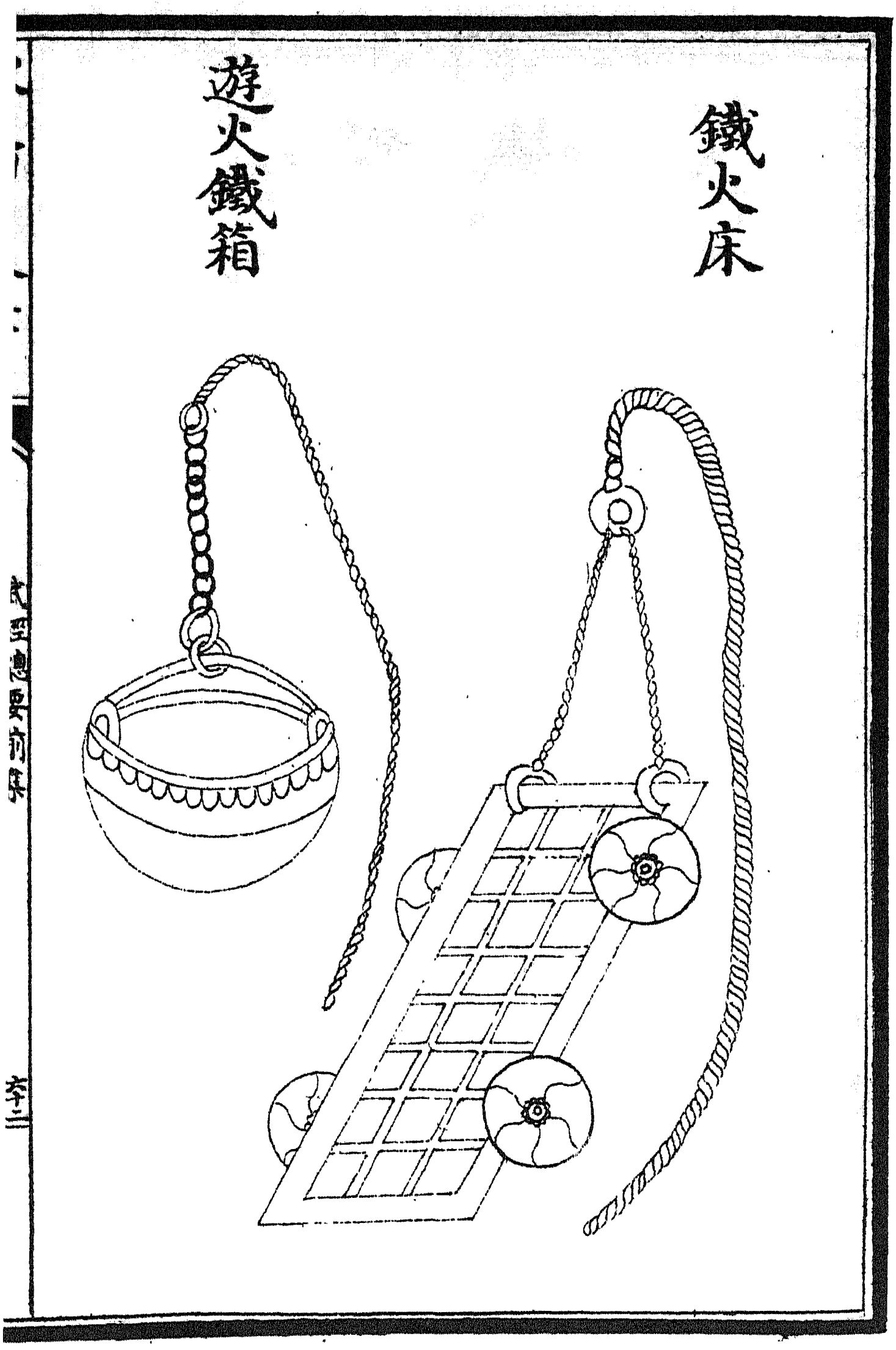


右燕尾炬束葦草下分兩岐如燕尾以脂油灌之發火自城上縋下騎其木驢板星燒之

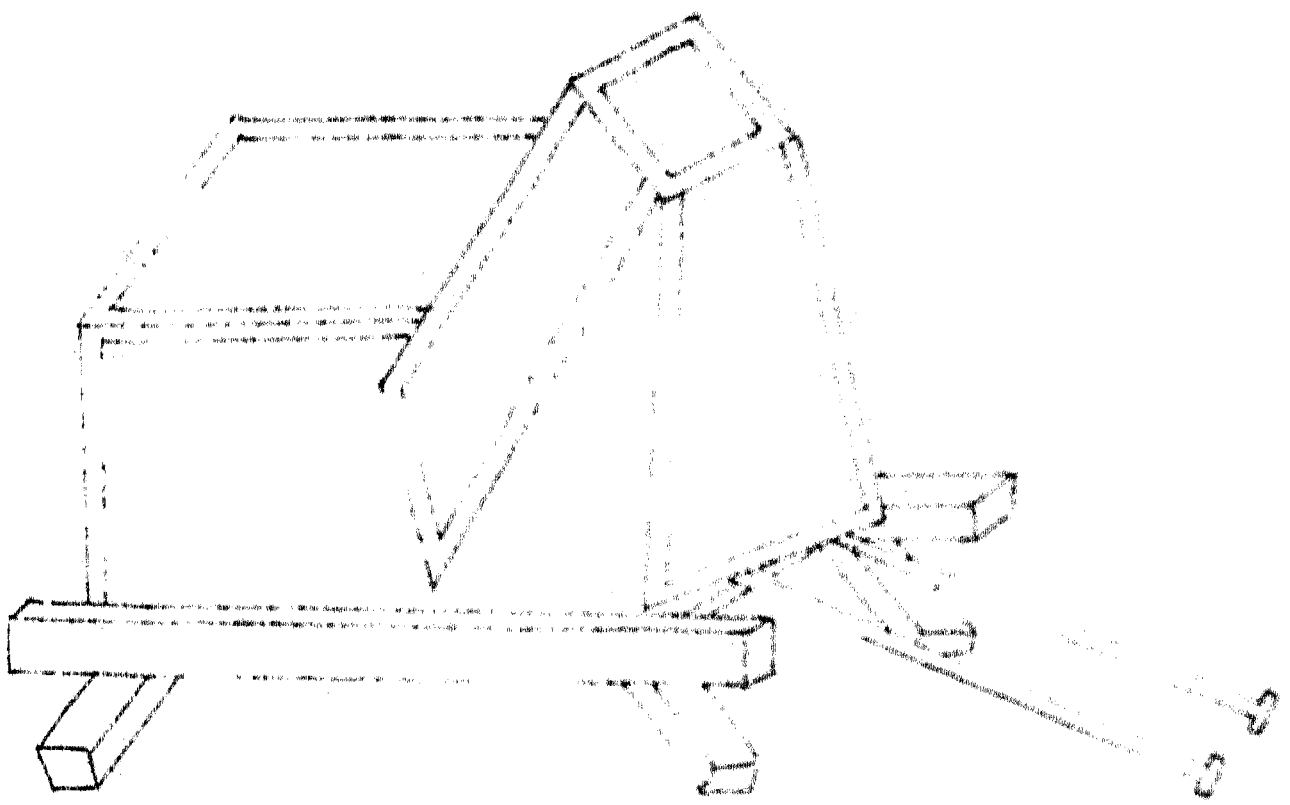
飛炬如燕尾炬城上設桔槔以鐵索縋之下燒攻城蟻附者

鞭箭用新青竹長一丈徑寸半為竿下施鐵索梢繫絲繩六尺別削勁竹為鞭箭長六尺有鏃度正中施一竹臬（亦謂之鞭子）放時以繩鈎臬繫箭于竿一人搖竿為勢一人持箭末激而發之利在射高中人如短兵

放火藥箭者如樺皮羽以火藥五兩貫鏃後燔而發之

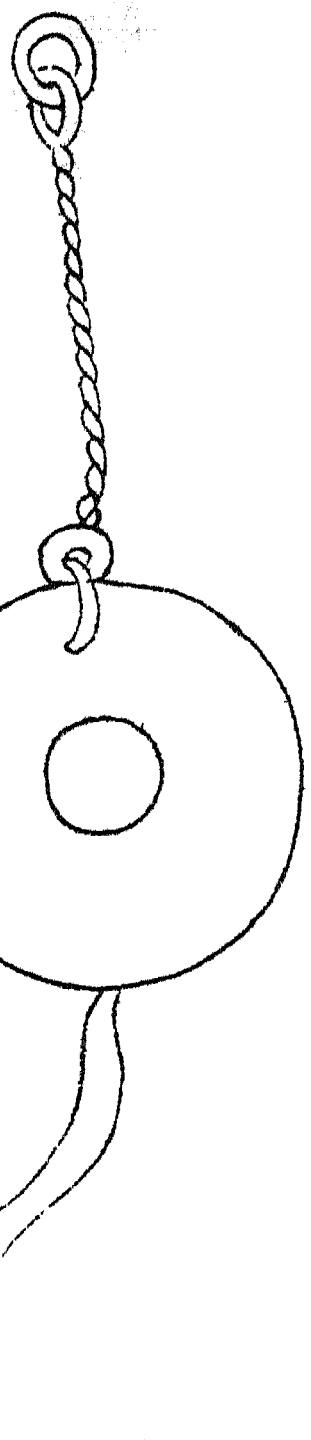

鐵火床
遊火鐵箱

爐行

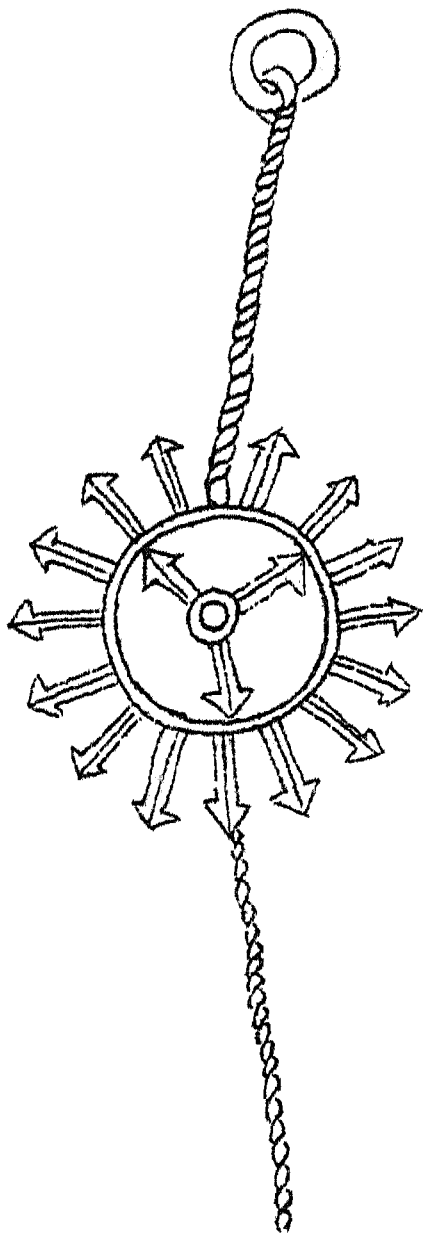


右鐵火床製用熟鐵長五六尺闊四尺下施四木輪以
鐵葉裹之首貫二鐵索上縛草火牛二十四束自城
縋下燒灼攻城者并可夜照城外
遊火箱以熟鐵如盔形盛薪火加艾蠟以鐵索縋下燒
灼穴中攻城人
行爐鎔鐵汁昇行於城上以潑敵人

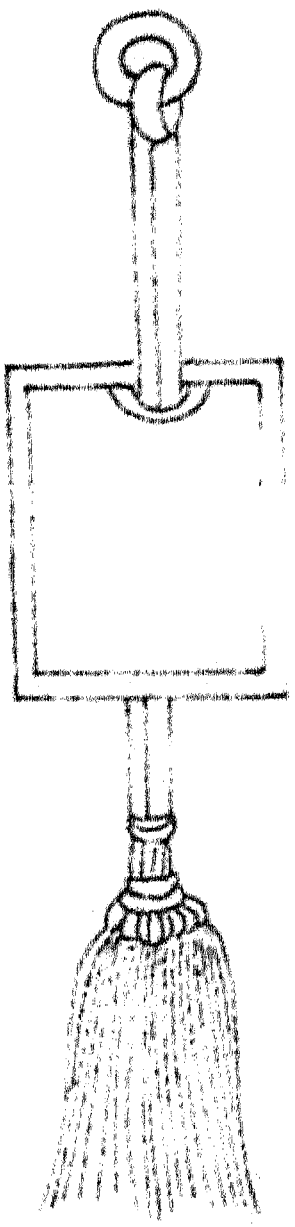
引火毬



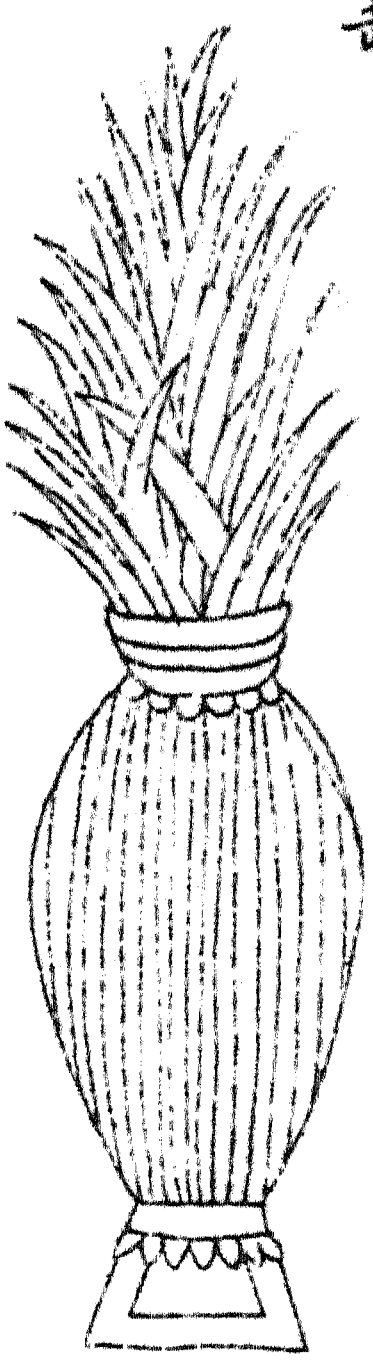
蒺藜火毬



鐵嘴火鷄



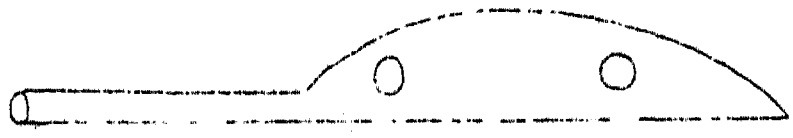
竹火鷄



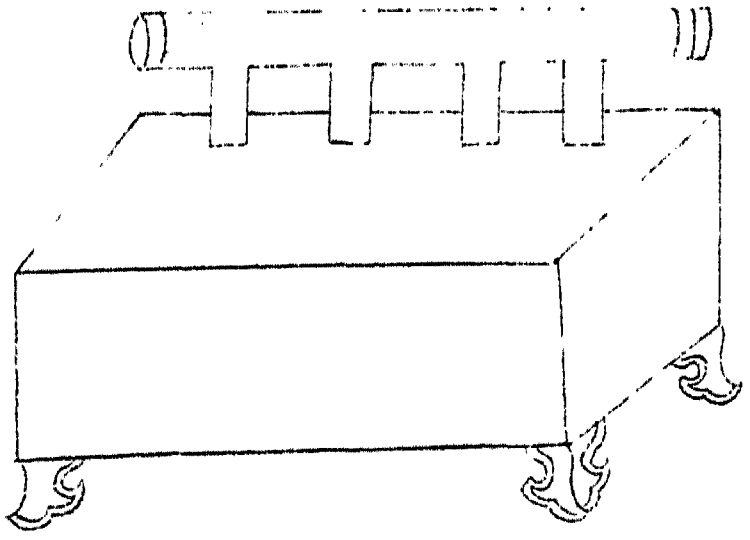
右引火毬以紙為毬內實塼石屑可重三五斤麥黃蠟
瀝青炭末為泥周塗其物貫以麻繩凡將放火毬只
先放此毬以準遠近
蒺藜火毬以三枝六首鐵刃以藥藥團之中貫麻繩長
一丈二尺外以紙并雜藥傅之又施鐵蒺藜八枚各
有逆鬚放時燒鐵錐烙透令焰出　火藥法用硫黃
一斤四兩焰硝二斤半麪炭末五兩瀝青二兩半乾
漆二兩半搥為末竹茹一兩一分麻茹一兩一分剪

碎用桐油小油各二兩半鎔汁和之傳用
紙十二兩半麻一十兩黃丹一兩一分炭末半斤以
瀝青二兩半黃蠟二兩半鎔汁和合周逢之
鐵嘴火鷄木身鐵觜束稈草為尾入火藥於尾內
竹火鷄編竹為疎眼籠腹大口狹形微脩長外糊紙數
重刷令黃色入火藥一斤在內加小卵石使其勢重
束稈草三五斤為尾二物與毬同若賊來攻城皆以
砲放之燔賊積聚及驚隊兵

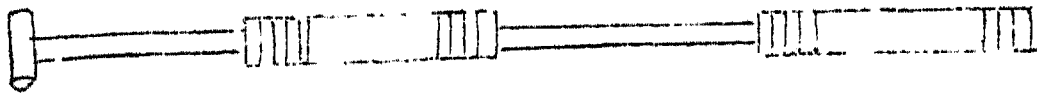
火樓



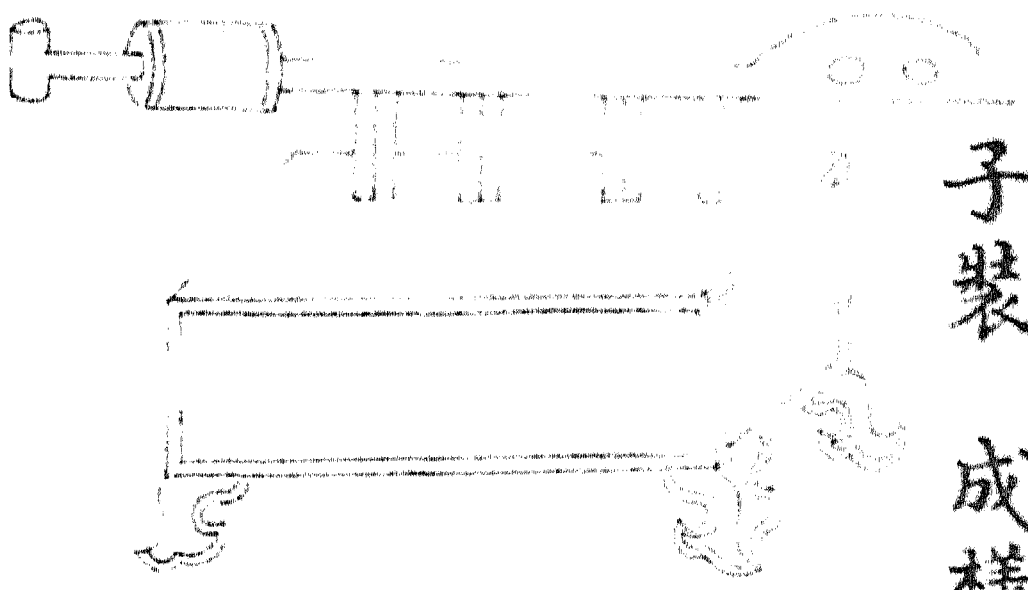
橫筒



杖絲拐

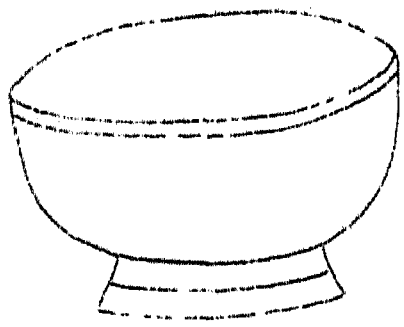


鏺火

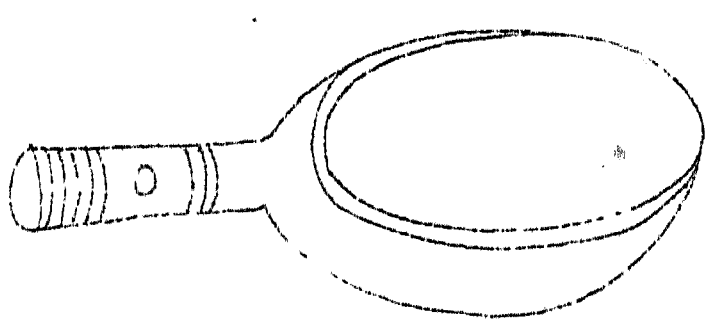


猛火油櫃筒櫃子裝成樣

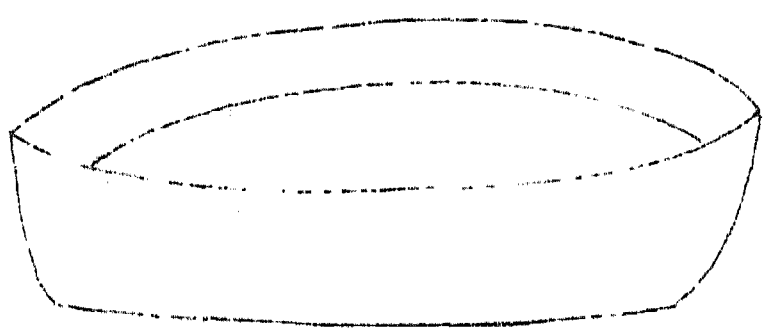
椀法



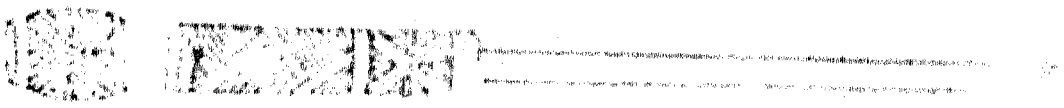
杓



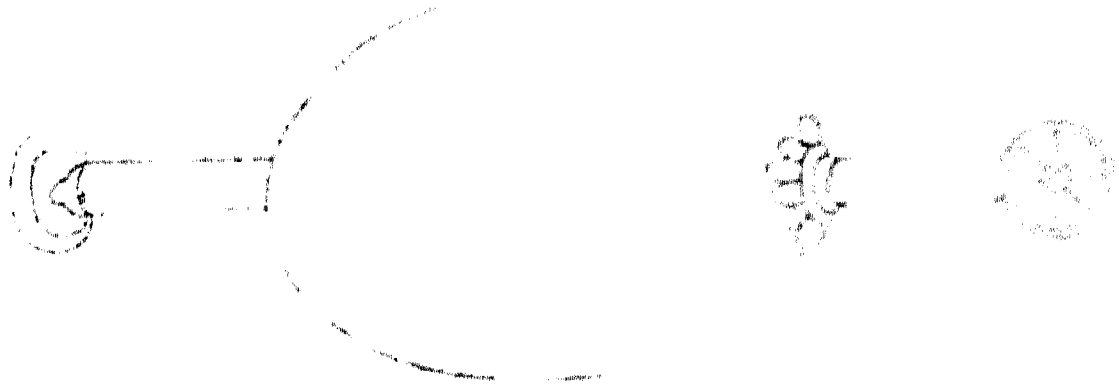
羅沙



錐　通

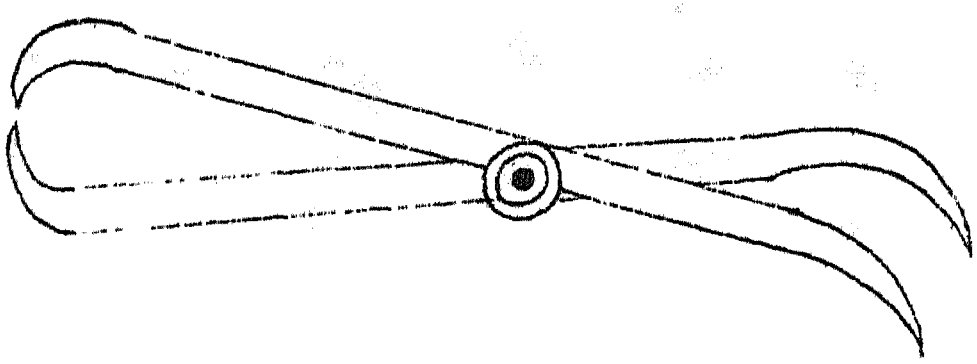


霹靂火毬

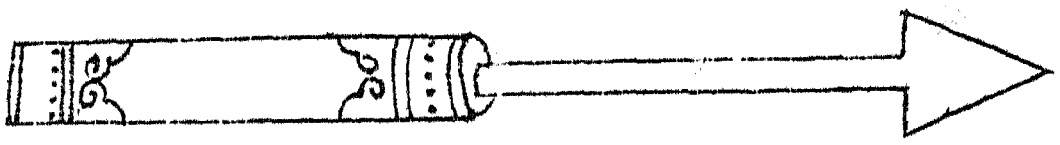


錐　鈎

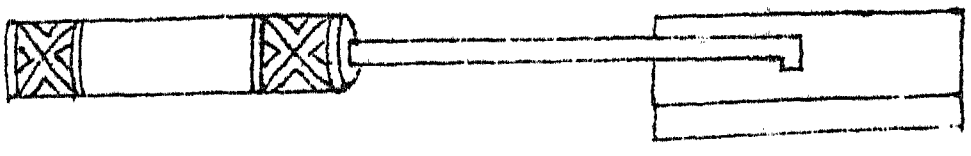
火鈐



錐烙



鐵烙



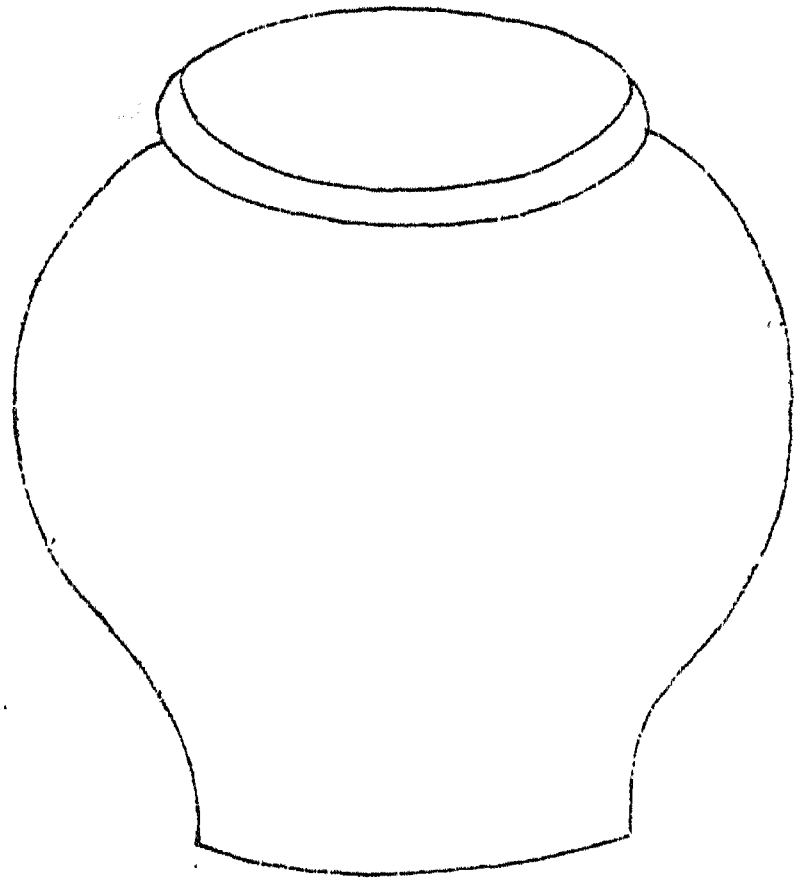
右放猛火油以熟銅為櫃下施四足上列四卷筒卷筒上橫施一巨筒皆與櫃中相通橫筒首尾大細尾開小竅大如黍粒首為圓口徑寸半櫃傍開一竅卷筒為口口有蓋為注油處橫筒內有撥絲杖杖首纏散麻厚寸半前後貫二銅束約定尾有橫拐拐前貫圓揜入則用閉筒口放時以杓自沙羅中挹油注櫃竅中及三斤許筒首施火樓注火藥於中使然發火用烙錐入撥杖於橫筒令人自後抽杖以力壓之油自

火樓中出皆成烈焰其挹注有椀有杓貯油有沙羅發火有錐貯火有鑵錐以開筒之壅塞有鈐以夾火有烙鉄以補漏（通櫃筒有鑄漏以蠟油青補之凡十二物除鈐錐烙鉄外悉以銅為之）一法為一大卷筒中央貫銅胡盧下施雙足內有小足相通（亦皆以銅為之）亦施拽絲杖其放法準上凡敵來攻城及大壕內及傅城上頗衆勢不能過則先用蓁蒜為火牛驅城下於踏空版內放猛火油中人皆糜爛水不能滅若水戰則可燒浮橋戰艦於上流放

之先於上流簸糠粃熱草以引其火

右霹靂火毬用乾竹兩三節徑一寸半無罅裂者存節勿透用薄瓷如鐵錢三十片和火藥三四斤裹竹為毬兩頭留竹寸許毬外加傳藥火藥外傳藥注具火毬說若賊穿地道攻城我則穴地迎之用火錐烙毬開聲如霹靂然以竹扇簸其煙焰以熏灼敵人放毬者舍甘草

聰地



右地聽於城內八分穴地如井各深二丈勿及泉令聽事聽審者以新甕自覆於井中坐而聽之凡賊至去城數百步內有穴城鑿地道者皆聲聞甕中可以辨方面遠近若審其處則鑿地迎之用熏灼法 法具霹靂毬說

托叉　火鉤　火鐮　鐵貓　氈

甕　柳罐　柳水灑

右常置城上托叉火鉤火鐮鐵貓濡氈以救焚甕柳罐以貯水　筒以使上

大燈籠　鐵　籠　燈搭子　蠟燭

樺燭

右常置城上用以備夜防賊攻城

鍬　鑺　鐵鏡　大斧　牛皮

石灰袋

右常置城上鍬鑺鏡斧牛皮以應緩急石灰袋颺颺以害蟻附攻城人以上並常用更不圖形

凡守城之法若寇賊將至城外五百步內悉伐木斷橋

焚棄宿草撤屋埋井有水泉皆投毒藥水石磚瓦茭芻餱糧畜牧與居民什器盡徙入城内徙不逮者焚之主將閱視守禦器械各令牢具又頂穿井無數惟無近城又備糧糒布帛芻草蘆葦茅荻石灰沙土鐵炭松樺蒿艾膏油麻皮氊荆棘篦籬釜鑊盆甕桶缶木石塼竹鍬钁鑱斧錐鑿梯索之類凡委於撝切積子智切及櫓棚扇門棧但火攻可及之處悉皆氊覆泥塗棚樓下隨處積檑木檑石鎗斧及他短兵外立弩車

砲架弩車砲架形制具攻城門棚樓女牆上加篦籬竹笆城中立望樓籍民中壯男為一軍以充兵人壯女為一軍以隸雜役老弱為一軍以供飲飼放牧樵採三軍無得相為探望延問軍中奇謀勇力機捷趺弛精伎絶能之士如雞鳴狗盜之類無不加禮以備防用城上每將各立一典掌呼索百用先作小旗數十枚有呼索即大書物名貼旗於上舉以示城下仍預撿校備用之物各為部分使吏主當謹伺見舉旗則應送城上

城下百步給雜役三五十人掌員挈所須索物仍各
授一官督領衢巷通夜張燈燭察姦人出入與軍士
之私相過從者量城上
防非時抽易五步有五長十步有十長百步有將別
令虞候領戰隊作雌雄契符以巡城所至與守隊勘
同乃過契符形制在符契門若賊勢外振士心內貳則或轉左
隊以為右易前軍以置後或一日數易或數日不移
又聞使人持偽契巡行將士每將各設四表

賊來近則舉一表賊至城則舉一表賊登城則舉三
表賊攀女牆則舉四表夜則加燭於表上虞候戰隊
視舉表處緩急如敵人向城乘城將士皆援立牌以
蔽障城及賊上並度賊遠近施放矢弓火毬火鷄鞭
箭飛炬城下則拋飛鈎賊若城壕則為火藥鞭箭以
射焚燒芻藁橋械賊傳城欲上則隨其處下檑木檑
石以擊之隨飛炬以燒其兵器下火床及以行爐鎔
鐵洒灼敵人颺石灰糠麩眯害其目踏空版內雜出

短兵下剌登者若登者漸多則禦以狼牙鐵拍手漸
攀城則以連枷棒擊之連枷之制具兵器門剌手斧斷之賊以
衝車等進則穿以鐵環木鑁放猛火油賊雲梯倚城
則引以竿推撞車賊木驢空孔音城則用絞車鐵撞燕
尾炬壞之賊飛砲石則張布幔繩遏勢賊為地道來
攻則為地聽候其來方穿井邀之霹靂火毬雜兵等
害之賊附高穴城則縋遊火箱灼之賊築土埋傍城
欲上則穿地道至埋下引取其土賊埋自壞凡穴地道所用

器械與攻城窒子所用器司其名件制度具在攻城器械門圖或賊薄城起堙相對則盛兵抵禦賊以火攻城則以城上應救火之具托义火鈎火鎌柳灑弓柳罐鐵猫手卽筒尋常之所預備者形制具攻城器械圖中若賊火猛至則為水袋水囊以投之一應棚樓器械雖已塗霢更頻舉麻搭潤濕若賊為火炬燒城門則下土沙滅之切勿以水加之則火勢愈熾賊若毒烟向城則列甕缶以水漿各實五分人覆面於上其煙最能犯鼻目賊夜圍城則每五十

步以一犬擊城下置食其前城上聞犬吠則縋火下照舉表加備又於城半腹每十步繫一燈籠又束蘆葦為椰捕以松明樺皮可用照城上城下（城下以鐵索縋之）賊或攻推女牆者則以木女代之或攻壞城門則以刀車塞之

凡賊攻城不利必引水灌城我則壅塞諸門察視城穴之處悉加傅築城內促圍望外水高下別築濶橋牆外取土可深一丈兵隊備城如故周視地勢有可洩

水處十數步開一井井內各相通以洩流之若水已入城則於新築牆外作船二十隻選勇士每船三十人質其父母妻子各授弓弩短兵鍬钁遣暝夜從銜枚並赴賊堤堰破賊營砦所選之士須預習水戰度力不能勝加船以進或賊已覺則城上設鼓

凡賊闕

城門我當偽為不知開以誘其入預設陷馬坑機橋於重牆曲巷內出兵迎擊引誘以陷之或約其入一二百人即下重垂鐘版

使其前敗後絶

凡城内器械戰備守禦已得當出奇用詐以戰代守以擊解圍先為暗門或因賊初至營陣未整或暮夜乘賊不覺或賊攻城初息或賊圍久已怠潛出精騎銜枚擊之擊敗不可遠襲或我兵已出賊未出賊突門而入則自城上向裏連下巨石擊壓以斷其入

凡城中日給百用至于水漿皆有限量令民竈為天井高突防火仍預下令凡失火者斬杜姦人也或城内

有火發只令本防官吏領丁徒救仍急報主將主將
遣左右親信人促往
凡城中失火及非常警動主將命擊鼓五通城上下吏
卒聞鼓不得輒離職掌民不得奔走街巷
凡賊至城外則城中不得妄舉高物如竿表之類及吹
弄樂器恐與賊應
凡城中有使至關
禆校民吏等各守職
掌不得私相探問

凡有曉星術占驗及軍陳之類不得與他人竊語及自論說怪誕以駭衆聽

凡號令一出主將并副將以下不得專異指揮餘依行軍約束條件

皇明經世文編

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校對官助教臣汪學金
謄錄監生臣周　瑛